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SYNTHETIC ORGANIC CHEMICALS

United States Production and Sales, 1988

(Investigation No. 332-135)

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UNITED STATES INTERNATIONAL TRADE COMMISSION

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United States Production and Sales, 1988

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Washington, 1989

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This report was prepared principally by Cynthia B. Foreso, Jesse Lawrence Johnson, Dr. Aimison Jonnard, Eric Land, Edward Matusik, David Michels, Elizabeth R. Nesbitt, James Raftery, Edward J. Taylor, Cynthia Trainor, and Steve Wanser.

Assistance in the preparation of the report was provided by Kenneth R. Kozel, Gwen L. Bennett, Brenda Carroll, Sharon Greenfield, Lemuel Shields, and Darlene Smith. Automa tic Data Processing input was provided by Barbara Bobbitt, James Gill, and Marie Jagannathan. Electronic publishing and design was provided by Pamela Chase, Joyce Bookman, and Betsy Davis-Nichols.

Address all communications to
Kenneth R. Mason, Secretary to the Commission
United States International Trade Commission
Washington, DC 20436

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Introduction

This is the 72st annual report of the U.S. International Trade Commission on domestic production and sales of synthetic organic chemicals and the raw materials from which they are made. The report, along with the quarterly report titled *Preliminary Report on U.S. Production of Selected Synthetic Organic Chemicals (Including Synthetic Plastics and Resin Materials)*, is prepared under investigation No. 332-135, Synthetic Organic Chemicals Reports. This investigation is conducted under the authority of section 332(g) of the Tariff Act of 1930 (19 U.S.C. 1322(g)), for the purpose of collecting data and preparing public reports on synthetic organic chemicals, plastics materials, medicinal chemicals, pesticides, and other organic chemical products. The annual report consists of 15 sections, each covering a specified group (based principally on use) of organic chemicals as follows: Coal tar, tar crudes and pitches; primary products from petroleum and natural gas for chemical conversion; cyclic intermediates; dyes; organic pigments; medicinal chemicals; flavor and perfume materials; plastics and resin materials; rubber-processing chemicals; elastomers; plasticizers; surface-active agents; pesticides and related products; miscellaneous end-use chemicals and chemical products; and miscellaneous cyclic and acyclic chemicals. Data have been supplied by approximately 718 producers.

Each of the 15 sections is headed by a summary of the statistical data. The first table in each section gives statistics on products and groups of products in as great detail as is possible without revealing the operations of individual producers. Statistics for an individual chemical or group of chemicals are given only when there are three or more producers, no one or two of which may be predominant. Moreover, even when there are three or more producers, statistics are not given if there is any possibility that their publication would violate the statutory provisions relating to unlawful disclosure of information accepted in confidence by the Commission.[1]

Data are reported by producers for only those items where the volume of production or sales or value of sales exceeds certain minimums. Those minimums for all sections are 5,000 pounds of production or sales or $5,000 of value of sales with the following exceptions: Plastics and resin materials—50,000 pounds or $50,000; pigments, medicinal chemicals, flavor and perfume materials, and rubber-processing chemicals—1,000 pounds or $1,000. They are usually given in terms of undiluted materials; however, products of 95 percent or greater purity are considered to be 100 percent pure. Commercial concentrations are applicable for dyes, certain plastics and resins, and a few solvents; such concentrations are specifically noted.

[1] 18 U.S.C. u 1905 and 44 U.S.C. u 3508.

The statistics given in this report include data from all known domestic producers of the items covered and include the total output of each company's plants, i.e., the quantities produced for consumption within the producing plant, as well as the quantities produced for domestic and foreign sale. The quantities reported as produced, therefore, generally exceed the quantities reported as sold. Some of these differences, however, are attributable to changes in inventory.

The second table in each section lists all items for which data on production or sales have been reported, by primary manufacturers, identified by manufacturers' codes. Each code consists of not more than three capital letters and is assigned on a permanent basis.

The third table in each section is a directory, alphabetized by the codes of the manufacturers reporting in that section.

Appendix A is a directory, alphabetized by the names of the manufacturers reporting in all sections and which includes their general corporate phone numbers and office addresses.

Appendix B lists synonymous names for cyclic intermediates. Information on synonymous names of the organic chemicals included in this report may be found in the *SOCMA Handbook: Commercial Organic Chemical Names*, published by the Chemical Abstracts Service of the American Chemical Society, or the *Colour Index* (Revised Third Edition), published jointly by the Society of Dyes and Colourists and the American Association of Textile Chemists and Colorists.

Appendix C presents the data in this report aggregated in the format of the Harmonized System (HS) nomenclature on a 6-digit HS basis.

Appendix D is an alphabetical index of all the products in this edition of the report.

Data contained in this report are compiled primarily from Commission's questionnaires sent to domestic producers and represent the best data available to the Commission. While the data supplied in the questionnaires are checked against data previously supplied by the submitting firm and with data supplied by other domestic producers, data are not independently verified by direct Commission examination of the books of companies furnishing information. Data contained in this report should not be used for investment and other purposes without independent verification.

As specified in the reporting instructions sent to manufacturers, production and sales (unless otherwise specified) are defined as follows:

PRODUCTION is the total quantity of a commodity made available by **Original Manufacturers Only** within the customs territory of the United States (includes the 50 states, the District of Columbia, and Puerto Rico). It covers synthetic organic chemicals, specified crudes from petroleum and coal tar, and certain chemically described natural products, such as, alkaloids, enzymes, and

perfume isolates. It is the sum—expressed in terms of 100% active ingredient unless otherwise specified in the reporting instructions—of the quantities:

- Produced, separated, and consumed in the same plant or establishment. A Commodity is considered separated either when it is isolated from the reactive system or when it is not isolated, but weighed, analyzed, or otherwise measured. This includes by-products and co-products that are not classifiable as waste materials;
- Produced and not isolated, but directly converted to a finished or semifinished item not included in this report (e.g., polyester film, polyurethane tires, nylon fiber, bar soap, etc.). (See specific instructions in individual sections);
- Produced and transferred to other plants or establishments of the same firm or 100% owned subsidiaries or affiliates;
- Produced and sold to, or bartered with, other firms (including less than 100% owned subsidiaries);
- Produced *for others* under toll agreements (see general instructions);
- Produced and held in stock.

PRODUCTION EXCLUDES:

- Purification of a commodity, which is purchased by, or transferred from within, the company, unless inclusion of such processing is specifically requested in the reporting instructions for individual sections;
- Intermediate products which are formed in the manufacturing process, but are not isolated from the reaction system—that is, not weighed, analyzed, or otherwise measured; except such products as described above as being produced and not isolated, but directly converted to a finished or semifinsihed item.
- Materials that are used in the process but which are recovered for re-use or sale;
- Waste products having no economic significance.

SALES are actual quantities of commodities sold by **Original Manufacturers Only.** Sales include the quantity and value of:

- Shipments of a commodity for domestic use or for export, or segregation in a warehouse when title has passed to the purchaser in a bona fide sale;
- Shipments of a commodity produced for you *by others* under toll agreement;
- Shipments to subsidiary or affiliated companies, provided the ownership is less than 100%.

SALES EXCLUDE:

- All intra-company transfers within a corporate entity;
- All shipments to 100% owned subsidiary or affiliated companies;
- All resales of imported or purchased material, including materials obtained by barter;
- All shipments of commodity produced *for others* under toll agreements.

VALUE OF SALES is the net dollar receipts of sales f.o.b. plant or warehouse, or delivered. F.o.b. values are preferred, but if they are not readily available form your records, delivered values are acceptable.

Summary

Combined production of all synthetic organic chemicals and primary products from petroleum and natural gas in 1988 was 387,659 million pounds—an increase of 2.4 percent from the output in 1987 (which also included data on tars) (table 1). Sales of these materials in 1988, which totaled 216,487 million pounds, valued at $93,406 million, were 5.1 percent larger than in 1987 in terms of quantity and 26.2 percent more in terms of value. These figures include data on production and sales of chemicals measured at several successive steps in the manufacturing process, and, therefore, they necessarily reflect some duplication. During 1984–88, the total output of these products rose each year except for 1985 (figure 1). During that period the output of these products generally followed the trend of the Federal Reserve Board Index of U.S. Production.

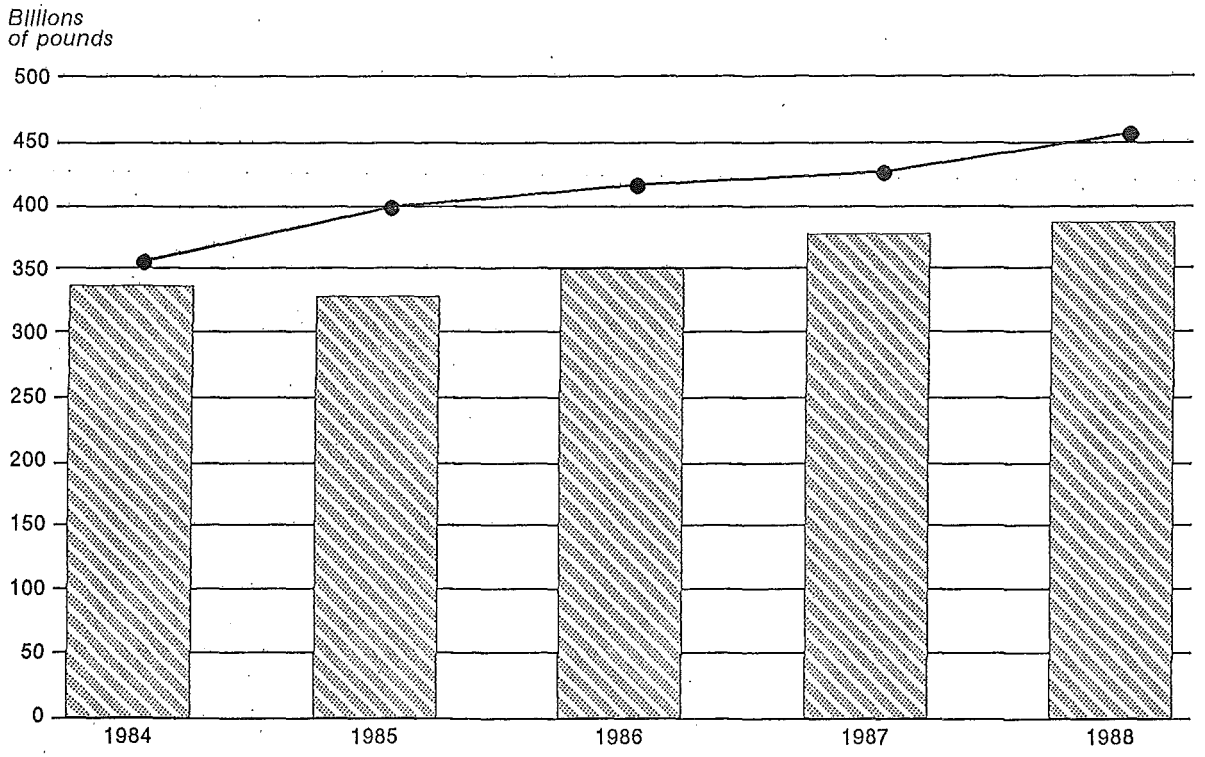
In 1988, production of all synthetic organic chemicals, including cyclic intermediates and finished products totaled 273,248 million pounds, or 8.0 percent more than the output in 1987. Eleven sections showed an increase in production in 1988 over 1987. Flavor and perfume materials (162 million pounds) increased by 28.5 percent; organic pigments (116 million pounds) increased by 23.4 percent; surface-active agents (7,316 million pounds) increased by 16.7 percent; plasticizers (2,300 million pounds) increased by 15.1 percent; miscellaneous end-use chemicals and chemical products (28,528 million pounds) increased by 13.1 percent; pesticides and related products (1,164 million pounds) increased by 12.0 percent; dyes (280 million pounds) increased by 9.9 percent, miscellaneous cyclic and acyclic chemicals (105,923 million pounds) increased by 8.1 percent; plastics and resin materials (63,536 million pounds) increased by 6.8 percent; cyclic intermediates (58,405 million pounds) increased by 5.8 percent; elastomer (synthetic rubber) (4,907 million pounds) increased by 4.6 percent; of the remaining sections, rubber processing chemicals (353 million pounds) showed a decreased of 7.7 percent; medicinal chemicals (258 million pounds) decreased 0.9 percent in 1988 from that in 1987.

Table 1
Synthetic organic chemicals and their raw materials U.S. production and sales, 1986 and 1987

	Production			*Sales*					
				Quantity			*Value*		
Chemical	*1987*	*1988*	*Increase or decrease (–), 1988 over 1987*[1]	*1987*	*1988*	*Increase or decrease (–), 1988 over 1987*[1]	*1987*	*1988*	*Increase or decrease (–), 1988 over 1987*[1]
	Million pounds	*Million pounds*	*Percent*	*Million pounds*	*Million pounds*	*Percent*	*Million dollars*	*Million dollars*	*Percent*
Grand total	378,465	387,659	2.4	206,048	216,487	5.1	74,012	93,406	26.2
Tar	2,291	1,970	–14.0	(2)	(2)	(2)	(2)	(2)	(2)
Primary products from petroleum and natural gas	123,119	112,441	–8.7	59,677	58,795	–1.5	7,620	10,517	38.0
Synthetic organic chemicals, total[3]	253,055	273,248	8.0	146,371	157,692	7.7	66,392	82,889	24.9
Cyclic intermediates	55,196	58,405	5.8	23,206	26,491	14.2	7,562	9,369	23.9
Dyes	255	280	9.9	230	251	9.2	677	766	13.1
Organic pigments	94	116	23.4	83	87	4.3	586	595	1.4
Medicinal chemicals	261	258	–0.9	167	228	36.9	1,534	1,831	19.4
Flavor and perfume materials	126	162	28.5	81	95	16.6	726	866	19.3
Plastics and resin materials	59,481	63,536	6.8	51,170	55,240	8.0	26,066	33,831	29.8
Rubber-processing chemicals	382	353	–7.7	289	266	–8.0	359	424	18.1
Elastomer (synthetic rubber)	4,690	4,907	4.6	3,109	3,234	4.1	2,714	2,982	9.9
Plasticizers	1,998	2,300	15.1	1,876	1,874	–0.1	896	1,001	11.8
Surface-active agents	6,269	7,316	16.7	3,923	4,261	8.6	1,713	2,303	34.5
Pesticides and related products	1,040	1,164	12.0	911	935	2.7	4,171	4,354	4.4
Miscellaneous end-use chemicals and chemical products	25,223	28,528	13.1	21,010	22,518	7.2	7,355	9,449	28.5
Miscellaneous cyclic and acyclic chemicals	98,040	105,923	8.1	40,317	42,212	4.7	12,032	15,118	25.7

[1] Percentage calculated from figures rounded to thousands.
[2] Not available
[3] Because of rounding, figures may not add to the totals shown.
Note.—Data for 1988 does not include ethane, propane, and butane production.
Source: Compiled from data received in response to questionnaire of the U.S. International Trade Commission.

Figure 1
Synthetic organic chemicals and their raw materials, total, vs FRB index



Source: Production, U.S. International Trade Commission, *Synthetic Organic Chemicals: United States Production and Sales;* FRB Index, The Board of Governors of the Federal Reserve System.

General

In this report, synthetic organic chemicals are classified on the basis of their principal use as follows: Cyclic intermediates, dyes, organic pigments, medicinal chemicals, flavor and perfume materials, plastics and resin materials, rubber-processing chemicals, elastomers (synthetic rubber), plasticizers, surface-active agents, pesticides and related products, miscellaneous end-use chemicals and chemical products, and miscellaneous cyclic and acyclic chemicals. Most of these groups are further subdivided either by use or by chemical composition. As intermediates, chemicals are used in the manufacture of finished products, aggregate figures that cover both intermediates and finished products necessarily include considerable duplication.

Total production of synthetic organic chemicals (intermediates and finished products combined) in 1988 was 273,248 million pounds, or 8.0 percent more than the output of 253,055 million pounds reported for 1987, and 161.0 percent more than the output of 104,711 million pounds reported in 1967 (see table 2). Sales of synthetic organic chemicals in 1988 amounted to 157,691 million pounds, valued at $82,888 million, compared with 146,371 million pounds, valued at $66,392 million, in 1987, and 55,177 million pounds, valued at $10,438 million, in 1967. Production of all cyclic (ring chemical structure) products (intermediates and finished products combined) in 1988 totaled 90,456 million pounds, or 6.5 percent more than the 84,979 million pounds reported for 1987, and 190.1 percent more than the 31,182 million pounds reported for 1967; however, the transfer of eight items, in 1979, from the primary products from petroleum and natural gas section to the section on cyclic intermediates has caused the output of cyclic products to appear much higher in relation to 1967 than would otherwise have resulted. Production of all acyclic (linear or branch chemical structure) products in 1988 totaled 177,885 million pounds, or 8.9 percent more than the 163,386 million pounds reported for 1987, and 155.2 percent more than the 69,707 million pounds reported for 1967. Differences in trends between cyclic and acylic products reflect the aggregation of changes in usage of individual chemicals rather than preferences for cyclic versus acyclic chemicals.

Table 2
Synthetic organic chemicals summary of U.S. production and sales of intermediates and finished products, 1967, 1987, and 1988

(Production and sales in thousands of pounds; sales value in thousands of dollars)

Chemicals	*1967*[1]	*1987*	*1988*	*Increase or decrease (-)* *1988 over 1967*	*1988 over 1987*
Organic chemicals, cyclic and acyclic, grand total:					
Production	104,711,357	253,055,030	273,247,742	161.0	8.0
Sales	55,176,823	146,371,462	157,691,512	185.8	7.7
Sales value	10,438,453	66,391,979	82,888,676	694.1	24.9
Cyclic, total:[2]					
Production	31,181,832	84,979,001	90,456,081	190.1	6.5
Sales	17,388,529	46,129,029	51,919,862	198.6	12.6
Sales value	4,170,713	31,158,174	35,676,925	755.4	14.5
Acyclic, total:[2]					
Production	69,706,980	163,385,671	177,885,089	155.2	8.9
Sales	34,526,250	97,133,672	102,537,182	197.0	5.6
Sales value	5,393,503	32,519,757	44,229,621	720.1	36.0
1. Cyclic Intermediates					
Production	20,793,132	55,196,139	58,404,663	180.9	5.8
Sales	9,461,180	23,205,872	26,490,507	180.0	14.2
Sales value	1,000,359	7,562,427	9,369,068	836.6	23.9
2. Dyes					
Production	206,240	255,198	280,387	36.0	9.9
Sales	198,592	229,763	250,838	26.3	9.2
Sales value	332,049	677,424	766,148	130.7	13.1
3. Organic Pigments					
Production	53,322	93,915	115,896	117.4	23.4
Sales	42,867	83,302	86,875	102.7	4.3
Sales value	108,354	586,254	594,657	448.8	1.4
4. Medicinal Chemicals					
Cyclic:					
Production	110,129	196,029	159,040	44.4	-18.9
Sales	70,120	103,833	110,881	58.1	6.8
Sales value	348,873	1,364,930	1,622,980	365.2	18.9
Acyclic:					
Production	69,941	64,588	99,161	41.8	53.5
Sales	56,804	62,668	117,018	106.0	86.7
Sales value	36,402	169,196	208,031	471.5	23.0

See footnotes at end of table.

Table 2—Continued
Synthetic organic chemicals summary of U.S. production and sales of intermediates and finished products, 1967, 1987, and 1988

(Production and sales in thousands of pounds; sales value in thousands of dollars)

Chemicals	1967[1]	1987	1988	Increase or decrease (-) 1988 over 1967	1988 over 1987
5. Flavors and Perfume Materials					
Cyclic:					
Production	57,978	70,740	78,378	35.2	10.8
Sales	47,285	56,239	57,060	20.7	1.5
Sales value	52,866	647,255	704,353	1232.3	8.8
Acyclic:					
Production	53,558	55,414	83,708	56.3	51.1
Sales	49,311	25,225	37,920	-23.1	50.3
Sales value	40,495	79,081	161,742	299.4	104.5
6. Plastics and Resin Materials					
Cyclic:					
Production	5,033,497	17,665,771	18,870,234	274.9	6.8
Sales	4,224,121	14,941,653	16,130,150	281.9	8.0
Sales value	1,036,940	10,582,852	13,735,504	1224.6	29.8
Acyclic:					
Production	8,759,452	41,814,939	44,665,906	409.9	6.8
Sales	7,753,242	36,228,390	39,110,090	404.4	8.0
Sales value	1,635,690	15,483,286	20,095,787	1128.6	29.8
7. Rubber-Processing Chemicals					
Cyclic:					
Production	220,139	354,372	318,482	44.7	-10.1
Sales	169,970	262,853	236,299	39.0	-10.1
Sales value	116,318	336,204	397,388	241.6	18.2
Acyclic:					
Production	43,994	27,642	34,248	-22.2	23.9
Sales	30,878	25,978	29,370	-4.9	13.1
Sales value	15,477	22,783	26,525	71.4	16.4
8. Elastomers (Synthetic Rubber)					
Production	3,822,545	4,690,358	4,906,572	28.4	4.6
Sales	3,262,044	3,108,761	3,234,468	-0.8	4.1
Sales value	874,237	2,714,048	2,982,130	241.1	9.9
9. Plasticizers					
Cyclic:					
Production	929,871	1,455,074	1,774,602	90.9	22.0
Sales	865,084	1,451,905	1,439,828	66.4	-0.8
Sales value	167,827	627,675	700,084	317.2	11.5
Acyclic:					
Production	332,908	543,421	525,814	58.0	-3.2
Sales	296,767	423,667	433,762	46.2	2.4
Sales value	93,142	267,991	301,219	223.4	12.4
10. Surface-Active Agents					
Cyclic:[3]					
Production	1,418,444	2,646,680	3,032,382	113.8	14.6
Sales	852,238	1,991,374	2,282,000	167.8	14.6
Sales value	95,810	595,083	1,000,033	943.8	68.1
Acyclic:					
Production	2,060,851	3,621,853	4,283,694	107.9	18.3
Sales	897,786	1,931,643	1,979,221	120.5	2.5
Sales value	220,877	1,117,633	1,303,218	490.0	16.6
11. Pesticides and Related Products					
Cyclic:					
Production	823,158	647,516	759,704	-7.7	17.3
Sales	681,532	592,839	572,160	-16.0	-3.5
Sales value	627,742	2,828,226	3,054,331	386.6	-8.0
Acyclic:					
Production	226,505	392,021	404,129	78.4	3.1
Sales	215,831	317,756	363,014	68.2	14.3
Sale value	159,301	1,342,357	1,299,407	715.7	-3.2
12. Miscellaneous End-Use Chemicals and Chemical Product					
Cyclic:					
Production	(1,535,922)	3,510,100	3,389,523	([5])	-3.4
Sales	(775,540)	1,904,165	2,741,704	([5])	44.0
Sales value	(283,575)	3,952,458	1,984,420	([5])	-49.8

See footnotes at end of table.

Table 2—Continued
Synthetic organic chemicals summary of U.S. production and sales of intermediates and finished products, 1967, 1987, and 1988

(Production and sales in thousands of pounds; sales value in thousands of dollars)

Chemicals	*1967*[1]	*1987*	*1988*	*Increase or decrease (-)* 1988 over 1967	1988 over 1987
12. Miscellaneous End-Use Chemicals and Chemical Product—*Continued*					
Acyclic:					
Production	(58,159,771)	21,713,001	25,138,350	(5)	15.8
Sales	(25,225,631)	19,106,276	19,776,367	(5)	3.5
Sales value	(3,192,119)	3,402,665	7,464,116	(5)	119.4
13. Miscellaneous Cyclic and Acyclic Chemicals					
Cyclic:					
Production	(5)	2,887,467	3,272,790	(5)	13.4
Sales	(5)	1,305,231	1,521,560	(5)	16.6
Sales value	(5)	1,397,386	1,747,959	(5)	25.1
Acyclic:					
Production	(5)	95,152,792	102,650,079	(5)	7.9
Sales	(5)	39,012,069	40,690,420	(5)	4.3
Sales value	(5)	10,634,765	13,369,576	(5)	25.7

[1] Standard reference base period for Federal Government general-purpose index numbers.
[2] Does not include data for elastomers.
[3] Includes ligninsulfonates.
[4] The data for 1967 are not comparable with current data as a result of a change in accounting procedures.
[5] Items in these two sections were previously included in the section named miscellaneous chemicals.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

The following tabulation shows, by chemical groups, the number of companies that reported production in 1988 of one or more of the chemicals included in each group.

Chemical group	*Number of companies*	*Chemical group*	*Number of companies*
Cyclic intermediates	178	Elastomers (synthetic rubber)	31
Dyes	35	Plasticizers	45
Organic pigments	32	Surface-active agents	155
Medicinal chemicals	85	Pesticides and related products	70
Flavor and perfume materials	33	Miscellaneous end-use chemicals and chemicals products	164
Plastics and resins materials	259	Miscellaneous cyclic and acyclic chemicals	263
Rubber-processing chemicals	23		

Section 1

Coal Tar, Tar Crudes and Pitches

Coal tar is produced chiefly by the steel industry as a by-product of the manufacture of coke; water-gas tar and oil-gas tar are produced by the fuel-gas industry. Production of coal tar, therefore, depends on the demand for steel; production of water-gas tar and oil-gas tar reflects the consumption of manufactured gas for industrial and household use. Water-gas and oil-gas tars have properties intermediate between those of petroleum asphalts and coal tar. Petroleum asphalts are not usually considered to be raw materials for chemicals.

The U.S. International Trade Commission began collecting data on crude coal tar for the 1986 reporting year. In 1988, U.S. production of crude coal tar decreased to 162 million gallons from 189 million gallons in 1987. Production of crude light oil increased from 66 million gallons, in 1987 to 69 million gallons in 1988.

Tar crudes are obtained from coke-oven gas and by distilling coal tar, water-gas tar, and oil-gas tar. The most important tar crudes are benzene, toluene, xylene, creosote oil, and pitch of tar. Some of these products are identical with those obtained from petroleum. Data for materials obtained from petroleum are included, for the most part, with the statistics for like materials obtained from coke-oven gas and tars, and are shown in table 3.

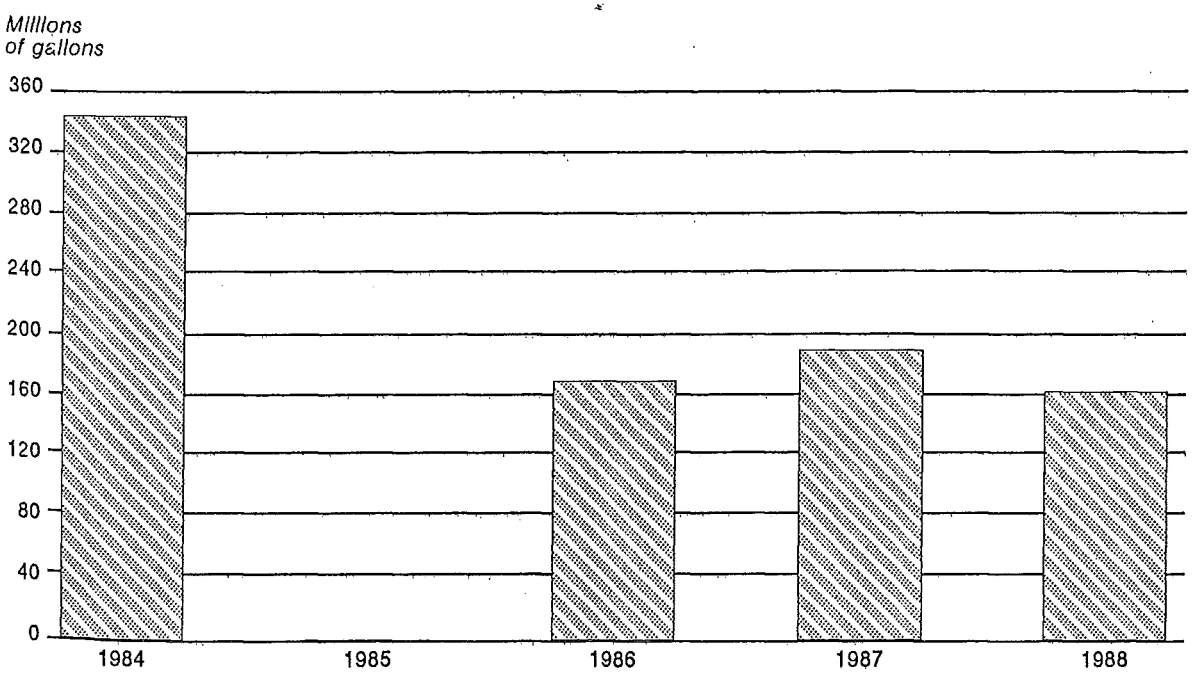
The domestic production by coke-oven operators of industrial and specification grades of benzene, toluene and xylene cannot be published since to do so would disclose the operations of individual companies. Some of the products obtained from tar and included in the statistics in table 3 are obtained from other products for which data are also included in the table. The statistics, therefore, involve considerable duplication, and for this reason no group totals or grand totals are given.

Table 4 lists the products reported in this section and indicates the manufacturer(s) of each by code. These codes are identified by company name in table 5.

Data for 1988 tar crudes were supplied by 25 companies and company divisions.

Cynthia B. Foreso
202-252-1348

Figure 2
Coal tar and tar crudes: U.S. production, 1984-88



Note.—Data for 1985 are not available.
Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 3

Coal tar, tar crudes and pitches: U.S. production and sales, 1988

Coal tar, tar crudes and pitches	Unit of Quantity	Production	Sales Quantity	Sales Value	Average Unit value[1]
				1,000 dollars	
Crude coal tar:					
Coke-oven operators	1,000 gal	162,170	132,844	49,734	$0.37
Crude light oil:					
Coke-oven operators	1,000 gal	68,801	68,673	33,766	.49
Light-oil distillates:					
Benzene, all grades, total[2]	1,000 gal	(3)	(3)	(3)	(3)
Coke-oven operators	1,000 gal	(3)	(3)	(3)	(3)
Petroleum refiners[4]	1,000 gal	1,588,333	1,091,164	1,133,458	1.04
Toluene, all grades, total[2]	1,000 gal	(3)	(3)	(3)	(3)
Coke-oven operators	1,000 gal	(3)	(3)	(3)	(3)
Petroleum refiners[5]	1,000 gal	873,685	513,213	444,179	.86
Xylene, all grades, total[2]	1,000 gal	(3)	(3)	(3)	(3)
Coke-oven operators	1,000 gal	(3)	(3)	(3)	(3)
Petroleum refiners[6]	1,000 gal	720,897	413,518	369,215	.89
Other tar distillates:					
Crude tar acid oils (having a tar acid content of 59% to less than 24%)	1,000 gal	3,143	2,648	3,106	1.17
Creosote oil (Dead oil) (100% creosote basis):					
Distillate as such (100% creosote basis)	1,000 gal	54,418	36,923	19,859	.54
Creosote in coal tar solution (100% solution basis)	1,000 gal	23,510	50,477	21,491	.43
Tar and tar pitches:					
Refined tar for uses other than road tar	1,000 gal	11,197	(3)	(3)	(3)
Pitch of tar:					
Hard	1,000 tons	591	(3)	(3)	(3)

[1] Unit value per gallon or ton as specified.
[2] Includes data for material produced for use in blending motor fuels. The annual production statistics for petroleum refiners on benzene, toluene, and xylene are not comparable with the combined monthly production figures because of fiscal year revisions.
[3] Statistics cannot be published; to do so would disclose the operations of individual companies.
[4] Benzene, high purity (98–100%).
[5] Toluene, high purity (98–100%).
[6] Mixed xylenes, high purity (98–100%).

Note 1.—Statistics for materials produced in tar and petroleum refineries are compiled by the U.S. International Trade Commission.

Note 2.—Data for all other tars and tar crudes are not included in the 1988 report because publication would disclose the operations of individual companies.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 4

Coal tar, tar crudes and pitches for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Coal tar, tar crudes and pitches	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 5)*
Light oil, light oil distillates, and tar bases:		
Crude light oil:		
Crude coal tar	Yes	ALS, ART, CGU, DTR, EKO, GSS, ILI, INL, KPT, LTV, NBC, SGO, TWD, WPS.
Crude light oil	Yes	ALS, ART, BTS, CGU, EKO, GSS, ILI, KPT, LTV, NBC, NTS, SGO, TWD, USX, WPS.
Light oil distillates:		
Benzene (Benzol):		
Tar (bases: crude bases (dry basis)	No	ABP, INL, KPT, NTS, USX.
Toluene (Toluol):		
Toluene (Toluol) other grades	No	ABP.
All other:		
All other light-oil distillates	No	LYP.
Other tar distillates:		
Naphthalene, crude:		
Methylnaphthalene	No	KPT.
Naphthalene, crude, solidifying at less than 74°C	No	BTS, COP, GSS.
Naphthalene, crude, solidifying at 76°C to less than 79°C	No	ACS, KPT.
Crude tar acid oils:		
Crude tar acid oils having a tar acid content of 5 percent to less than 24 percent	Yes	ACS, INL, KPT.
All other crude tar acid oils:	No	NTS.
Cresylic acid, crude:		
Sodium cresylate	No	KPT.
Creosote oil (Dead oil):		
Creosote oil (Dead oil): creosote content in solution (100 percent basis)	No	RIL.
Creosote oil (Dead oil): creosote in coal tar solution (100 percent solution basis)	Yes	ACS, ART, KPT, RIL.
Creosote oil (Dead oil): distillate as such (100 percent creosote basis)	Yes	ACS, ART, COP, KPT, RIL.
All other distillate products:		
Carbon black oil	No	ACS.
Crude coal tar solvent	No	KPT.
Priming and refractory oil	No	ART, BTS, KPT.
All other tar distillates	No	GIV.
Tar and tar pitches:		
Tar, road:		
Tar, road	No	ACS, RIL.
Tar for other uses:		
Tar for other uses: crude	No	ALS, BTS, IGC.
Tar for other uses: refined	Yes	ACS, COP, KPT, RIL.
Pitch of tar:		
Pitch of tar: hard (M.P. 161° F and over)	Yes	ACS, ART, KPT, RIL.
Pitch of tar: medium (M.P. 110° To 160° F)	No	ART, COP, KPT, RIL.
Pitch of tar: soft (M.P. 80° To 109° F)	No	ART, COP.
All other:		
All other pitch of tar	No	WPS.

[1] Chemicals for which separate statistics are reported in this section are indicated by "Yes." Chemicals for which data are accepted in confidence and may not be published are indicated by "No."

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

See footnotes at end of table.

Table 5
Coal tar, tar crudes and pitches: Directory of manufacturers, alphabetical by code, 1988

Code	Name of company	Code	Name of company
ABP	Drummond Co. Inc.	GSS	Gulf States Steel
ACS	Allied Signal, Inc., Engineered Materials Sector	IGC	Indiana Gas & Chemical Corp.
		ILI	Acme Steel Corp.
ALS	Armco, Inc. Eastern Steel Div.	INL	Inland Steel Co.
		KPT	Beazer Material & Service, Inc.
ART	Aristech Chemical Corp.: Chemical Div. Gary Works	LTV	LTV Steel Co.
		LYP	Lyondell Petrochemical Co.
		NBC	New Boston Coke Corp.
BTS	Bethlehem Steel Corp.	NTS	National Steel Corp., Great Lakes Plant
CGU	Citizen Gas And Coke Utility	RIL	Reilly Industries, Inc.
COP	Coopers Creek Chemical Corp.	SGO	Shenango, Inc.
DTR	Detroit Coke Corp.	TWD	Tonawanda Coke Corp.
EKO	Empire Coke Co.	USX	USS, DIV., Of USX
GIV	Givaudan Corp.	WPS	Wheeling-Pittsburg Steel Corp.

Note.—Complete names, telephone numbers, and addresses of the above reporting companies are listed in app. A.
Source: Compiled from data received in response to questionnaires of the U.S International Trade Commission.

Section 2

Primary Products from Petroleum and Natural Gas for Chemical Conversion

Primary products that are derived from petroleum and natural gas are related to the intermediates and finished products made from such primary materials in much the same way that crude products derived from the distillation of coal tar[1] are related to their intermediates and finished products. Many of the primary products derived from petroleum are identical with those derived from coal tar (e.g., benzene, toluene, and mixed xylenes). Considerable duplication exists in the statistics on the production and sales of primary petroleum products because some of these primary chemicals are converted to other primary products derived from petroleum and because data on some production and sales are reported at successive stages in the conversion process. The statistics are sufficiently accurate, however, to indicate trends in the industry. Many of the primary products for which data are included in the statistics may be used either as fuel or as basic materials from which other chemicals are derived. In this report every effort has been made to exclude data on materials that are used as fuel; however, data are included on toluene and mixed xylenes, which are used in blending aviation and motor fuel.

The total production of primary products derived from petroleum and natural gas during 1984–88 is shown in figure 3. Beginning in 1988, production and sales data no longer are collected for ethane, propane, and butane. Total production for primary products during 1988 amounted to 112,441 million pounds, a 9 percent increase over 1987 production without ethane, propane, and butane data.

The output of aromatic and naphthenic products from petroleum amounted to 29,220 million pounds in 1988, compared with 26,762 million pounds in 1987. Sales amounted to $2,254 million in 1988 and $1,946 million in 1987. In 1988, production of high purity benzene was 11,627 million pounds; production of high purity toluene was 6,299 million pounds; and production of high purity mixed xylenes was 5,479 million pounds (table 6).

Production of all aliphatic hydrocarbons and derivatives from petroleum and natural gas was 83,220 million pounds in 1988. Sales of these products were valued at $8,262 million. Production of ethylene was 37,204 million pounds in 1988. The output of 1,3-butadiene was 3,169 million pounds and propylene production was 21,224 million pounds during 1988 (table 6).

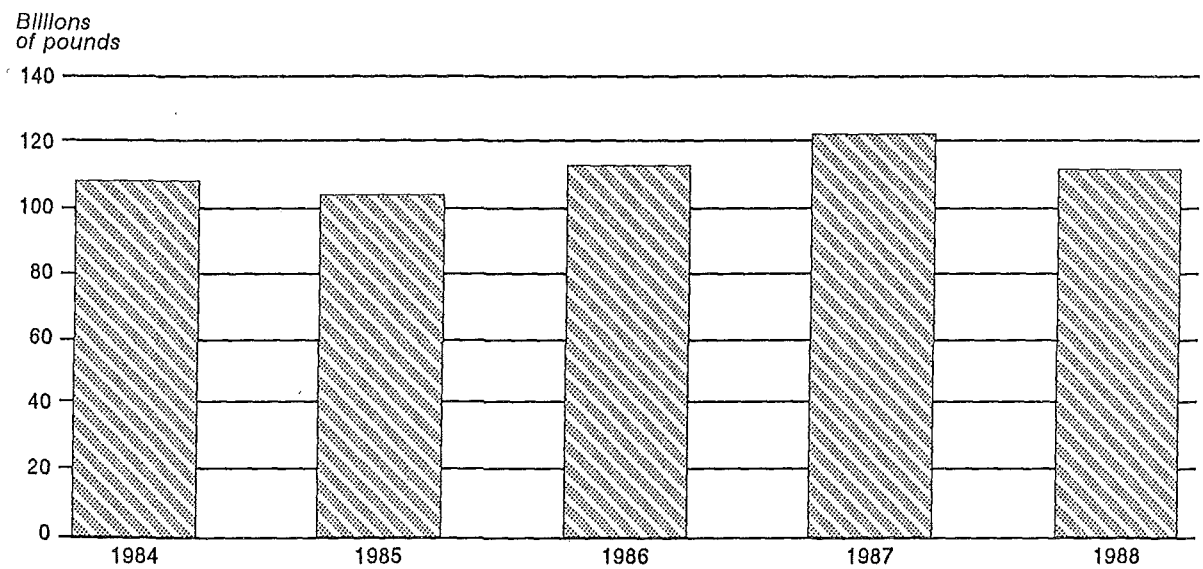
Table 7 lists the products reported in this section and indicates the manufacturer of each by code. The codes are identified by company name in table 8.

Data for 1988 primary products from petroleum and natural gas for chemical conversion were supplied by 67 companies or company divisions.

James Raftery
202-252-1365

[1] Statistics on chemicals from coal tar are given in Section 1 (Tar and Tar Crudes) of this report.

Figure 3
Primary products from petroleum and natural gas for chemical conversion: U.S. production 1984-88



Note.—Data for 1988 does not include ethane, propane, and butane production.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 6

Primary products from petroleum and natural gas for chemical conversion: U.S. production and sales, 1988

Primary products from petroleum and natural gas for chemical conversion	Production	Sales		Average Unit value[1]
		Quantity	Value	
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Grand total	112,440,599	58,795,094	10,516,612	$.18
Aromatics and naphthenes[2]				
Total	29,220,164	18,205,338	2,254,113	.12
Benzene, all grades, total	(3)	(3)	(3)	(3)
High purity (98-100%)	11,626,594	7,987,323	1,133,458	.14
Other (90-97.9%)	(3)	(3)	(3)	(3)
Toluene, all grades, total	(3)	(3)	(3)	(3)
High purity (98-100%)	6,299,270	3,707,473	444,179	.12
Other (90-97.9%)[4 5]	(3)	(3)	(3)	(3)
Xylenes, mixed, total	(3)	(3)	(3)	(3)
High purity (98-100%)	5,478,817	3,142,740	369,215	.12
Other (90-97.9%)	(3)	(3)	(3)	(3)
All other aromatics and naphthenes[6]	5,815,483	3,367,802	307,261	.09
Aliphatic hydrocarbons				
Total	83,220,435	40,589,756	8,262,499	.20
C_2 Hydrocarbons, total[7]	37,203,908	14,553,625	3,695,038	.25
Acetylene[8] (For chemical use only)	(3)	(3)	(3)	(3)
Ethylene	37,203,908	14,553,625	3,695,038	.25
C_3 Hydrocarbons, total[9]	21,223,882	13,356,176	2,196,937	.16
Propylene[10]	21,223,882	13,356,176	2,196,937	.16
C_4 Hydrocarbons, total[11]	12,574,552	6,368,316	1,073,176	.17
Butadiene and butylene fractions	1,869,981	1,123,645	127,568	.11
1,3-Butadiene, grade for rubber (elastomers)	3,168,823	2,914,724	632,780	.22
1-Butene	638,464	349,236	80,213	.23
Isobutane	969,092	490,669	41,415	.08
Isobutylene	1,243,805	396,652	67,327	.17
All other C_4 hydrocarbons[12]	4,684,387	1,093,390	123,873	.11
C_5 Hydrocarbons, total	3,332,654	1,091,027	132,577	.12
Isoprene (2-Methyl-1,3-butadiene)	367,706	244,163	44,115	.18
n-Pentane	255,039	(3)	(3)	(3)
Pentenes, mixed	288,160	(3)	(3)	(3)
Piperylene (1,3-Pentadiene)	122,989	116,702	16,986	.15
All other C_5 hydrocarbons[13 14]	2,298,760	730,162	71,476	.10
All other aliphatic hydrocarbons, derivatives and mixtures, total	8,885,439	5,220,612	1,164,771	.22
Alpha olefins, C_6-C_{10}	871,310	(3)	(3)	(3)
Alpha olefins, C_{11} and higher	694,074	385,877	165,518	.43

See footnotes at end of table.

Table 6—Continued

Primary products from petroleum and natural gas for chemical conversion: U.S. production and sales, 1988

Primary products from petroleum and natural gas for chemical conversion	*Production*	*Sales*		*Average Unit value*[1]
		Quantity	*Value*	
	1,000 pounds	*1,000 pounds*	*1,000 dollars*	*Per pound*
Aliphatic hydrocarbons—Continued				
All other aliphatic hydrocarbons, derivatives and mixtures—Continued				
Dodecene (Tetrapropylene)	336,849	294,157	59,039	.20
n-Heptane	158,806	155,693	23,581	.15
Hexane	678,535	758,286	76,227	.10
Nonene (Tripropylene)	576,229	302,611	66,017	.22
n-Paraffins[15]	2,289,879	1,699,444	226,404	.13
All other[16]	3,279,757	1,624,544	547,985	.34

[1] Calculated from rounded figures.
[2] The chemical raw materials designated as aromatics are in some cases identical with those obtained from the distillation of coal tar; however, the statistics given in the table above relate only to such materials as are derived from petroleum and natural gas. Statistics on production and/or sales of benzene, toluene, and xylene from all sources are given in table 1 of the report on "Tar and Tar Crudes."
[3] Reported data are accepted in confidence and may not be published, or no data were reported.
[4] Includes toluene, solvent grade, 90 percent.
[5] Includes toluene and xylene used as solvents; may include that which is blended in aviation and motor gasolines.
[6] Includes data for alkyl aromatics, crude cresylic acid, cyclopentane, naphthalene, naphthenic acid, carbon black feedstock, distillates, solvents and miscellaneous cyclic hydrocarbons. Also includes production and/or sales data for the other than high purity grades of benzene, toluene, and mixed xylenes.
[7] Ethane production and sales data are no longer collected.
[8] Production figures on acetylene from calcium carbide for chemical synthesis are collected by the U.S. Bureau of the Census.
[9] Propane production and sales data are no longer collected.
[10] Includes data for refinery propylene.
[11] Butane production and sales data are no longer collected.
[12] Includes production and/or sales data for 2-butene, mixtures of 1-butene and 2-butene, and mixed C_4 streams.
[13] Includes data for mixtures of C_5 hydrocarbons, isopentane, and 2-pentene.
[14] Includes sales data only for n-pentane and mixed pentenes.
[15] Includes data for the following chain lengths: C_6-C_9, C_9-C_{15}, C_{10}-C_{14}, C_{10}-C_{16}, C_{12}-C_{18} and others.
[16] Includes production and/or sales data for acetylene, alpha olefins (C_6-C_{10}), methane, isoheptanes, isohexane, iso-octane, neohexane, mixed hexenes, mixed heptenes, mixed octenes, n-octane, di-isobutylene, eicosane, mixtures of C_2 and C_3, C_5-C_6, C_5-C_7, C_6-C_7 hydrocarbons, hydrocarbon derivatives, and other hydrocarbons.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 7

Primary products from petroleum and natural gas for chemical conversion for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Primary products from petroleum and natural gas for chemical conversion	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 8)*
Aromatics and naphthenes:		
Alkyl aromatics:		
Cyclosols	No	CXI.
All other alkyl aromatics	No	SHC.
Benzene total:		
Benzene high purity (98-100%)	Yes	AMO, ASH, CCP, CNE, CSD, CSP, DOW, ENJ, GRS, HES, LYP, MOC, PLC, PPR, SHC, SIO, SM, SOC, SOG, SUN, SWR, TOC, TX, UOC, USI.
Benzene other	No	AMO, KHI, KLM, VST.
Cresylic acid (less than 75 percent distilling over 215° C)	No	KHI, PSG.
Cyclopentane	No	PLC.
Naphthalene	No	CXI, TX.
Naphthenic acid:		
Naphthenic acid, acid number 150-199	No	CPS, HEC, MER.
Naphthenic acid, acid number 200-224	No	MER, PSG.
Naphthenic acid, acid number 225-249	No	PSG.
Naphthenic acid, acid number less than 150	No	HEC, SHC.
Toluene total:		
Toluene high purity (98-100%)	Yes	ASH, CNE, CSD, DOW, ENJ, GRS, HCL, HES, KHI, LYP, MOC, PLC, PPR, PPX, SC, SHC, SIO, SM, SOG, SUN, SWR, TOC, TX, UOC.
Toluene other	No	SHC, SOC.
Xylenes, mixed, total:		
Xylene high purity (98-100%)	Yes	AMO, ASH, CSD, ENJ, GRS, HES, LYP, PLC, PPR, SHC, SOG, SUN, SWR, UOC.
Xylene other	No	AMO, MOC, TOC.
All other aromatics and naphthenes:		
Aromatics, C_9	No	MOC.
Benzene, toluene, xylene, mixtures	No	ELP.
All other products from petroleum and natural gas, cyclic	Yes	AMO, ASH, BAS, BFG, EKX, ELP, ENJ, LYP, OMC, PLC, SHC, TX, UCC, UPM, VST.
Aliphatic hydrocarbons:		
C_1 Hydrocarbons:		
Methane	No	SHO.
C_2 Hydrocarbons:		
Acetylene (for chemical use only)	No	RH, UCC.
Ethylene	Yes	AMO, BAS, BFG, CNE, DOW, DUP, EKX, ELP, ENJ, HKO, KHI, LYP, MCB, OMC, PLC, SHC, SM, SOC, SUN, TX, UCC, USI, UTP, VST.
C_3 Hydrocarbons:		
Hydrocarbons, C_2-C_3, mixtures	No	CGO, TU, UCC.
Propylene	Yes	AMO, ASH, BAS, BFG, CCP, CGO, CLK, CNE, CSD, DA, DOW, DUP, EKX, ELP, ENJ, GRS, HKO, KHI, LYP, MCB, MOC, PLC, PPS, SHC, SIO, SM, SOC, SOG, SUN, TCR, TX, UCC, USI, UTP, VLR, VST.
C_4 Hydrocarbons:		
Butadiene and butylene fractions	Yes	BAS, DA, DOW, EKX, ELP, HKO, PLC, SOC, TX, UCC, USI, VST.
1,3-Butadiene, grade for rubber (Elastomers)	Yes	AMO, CNE, DOW, ENJ, LYP, SHC, SM, TPC, TX.
1-Butene	Yes	ENJ, SHC, SM, SOC, TNA, TPC.
2-Butene	No	TPC.
1-Butene and 2-butene, mixed	No	LYP, SHC, TNA.
Hydrocarbons, C_4 fraction	No	KHI, TX.

See footnotes at end of table.

Table 7—Continued

Primary products from petroleum and natural gas for chemical conversion for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Primary products from petroleum and natural gas for chemical conversion	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 8)*
Aliphatic hydrocarbons—Continued		
C_4 Hydrocarbons—Continued		
Hydrocarbons, C_4 mixtures	No	LYP, MCB, PPR, SOG.
Isobutane (2-Methylpropane)	Yes	AMO, CSP, DA, ENJ, KHI, PLC, SHO, SM, SUN, TX.
Isobutylene (2-Methylpropene)	Yes	AMO, ATR, ENJ, SHC, TPC, TX.
All other C_4 hydrocarbons	No	ENJ, SM, TX.
C_5 Hydrocarbons:		
Hydrocarbons, C_5 mixtures	No	GYR, HKO, LYP.
Isopentane (2-Methylbutane)	No	PLC, SHO.
Isoprene (2-Methyl-1,3-butadiene)	Yes	DOW, ENJ, GYR, LYP, SOC.
n-Pentane	Yes	ASH, KHI, PLC, SHO.
2-Pentene.	No	BFG, DOW.
Pentenes, mixed	Yes	CSP, CXI, PLC, SHO, TX.
Piperylene (1,3-Pentadiene)	Yes	CXI, DOW, LYP.
All other C_5 hydrocarbons	No	DA, ENJ, SHC, TX.
All other aliphatic hydrocarbons, derivatives, and mixtures, total:		
C_6 Hydrocarbons:		
Hexane	Yes	ASH, ENJ, HMY, PLC, SHO, SOG, TX, UOC.
1-Hexene	No	PLC.
Hexenes, mixed	No	ENJ.
Hydrocarbons, C_5-C_6 mixtures	No	PLC.
Hydrocarbons, C_5-C_7 mixtures	No	ENJ.
Isohexane	No	PLC.
Neohexane (2,2-Dimethylbutane)	No	PLC.
All other C_6 hydrocarbons	No	PLC, SHC, SM, TX.
C_7 Hydrocarbons:		
n-Heptane	Yes	ENJ, PLC, SOG, TX, UOC.
Heptenes, mixed	No	ENJ, TX.
Hydrocarbons, C_6-C_7 mixtures	No	TX.
Isoheptanes	No	PLC.
All other C_7 hydrocarbons	No	EKX, PPR.
C_8 Hydrocarbons:		
Di-isobutylene (Di-isobutene)	No	EKT, TPC.
n-Octane	No	SOG.
Octenes, mixed	No	ENJ, TX.
2,2,4-Trimethylpentane (Iso-octane)	No	LYP, PLC.
All other C_8 hydrocarbons	No	SHC.
C_9 and above Hydrocarbons (except alpha olefins):		
Dodecene	Yes	ATR, ENJ, SOC, SUN, UOC.
Eicosane	No	HMY.
Nonene (Tripropylene)	Yes	ATR, ENJ, SOC, SWR, TX, UOC.
Alpha olefins:		
Alpha olefins, C_6-C_{10}	Yes	SHC, SOC, TNA.
Alpha olefins, C_{11} and higher	Yes	SHC, SOC, TNA.
N-Paraffins-carbon chain length:		
n-Paraffins, C_{10}-C_{14}	No	ENJ, SHC, TX, UOC.
n-Paraffins, C_{10}-C_{16}	No	VST.
n-Paraffins, C_{12}-C_{19}	No	VST.
n-Paraffins, C_6-C_9	No	SOG, UOC.
n-Paraffins, C_9-C_{15}	No	SHC, SOG, UOC.
All other n-Paraffins	No	ENJ, SOG, UOC.
Polybutene	No	AMO.
Hydrocarbon derivatives:		
n-Butyl mercaptan (1-Butanethiol)	No	PAS, PLC.
sec-Butyl mercaptan (2-Butanethiol)	No	HAP, PLC.
tert-Butyl mercaptan (2-Methyl-2-propanethiol)	No	HAP, PAS, PLC.
Di-tert-butyl disulfide	No	PLC.

See footnotes at end of table.

Table 7—Continued

Primary products from petroleum and natural gas for chemical conversion for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Primary products from petroleum and natural gas for chemical conversion	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 8)*
Aliphatic hydrocarbons—Continued		
Hydrocarbon derivatives—Continued		
Diethyl sulfide (Ethyl sulfide)	No	HAP, PAS.
Dimethyl sulfide	No	PAS.
Ethyl mercaptan (Ethanethiol)	No	HAP, PAS, PLC.
Ethylthioethanol	No	HAP.
Isopropyl mercaptan (2-Propanethiol)	No	HAP, PAS, PLC.
Methyl ethyl sulfide	No	CED, HAP, PAS.
Methyl mercaptan (Methanethiol)	No	PAS.
Octyl mercaptans	No	PAS.
n-Propyl mercaptan (1-Propanethiol)	No	PAS, PLC.
Thiophane (Tetrahydrothiophene)	No	HAP.
All other hydrocarbon derivatives	No	PAS, PLC, SHC.
All other hydrocarbons, C_6 and above, including mixtures	No	NES, PLC, SOC, TNA.

[1] Chemicals for which seperate statistics are reported in this section are indicated by 'Yes.' Chemicals for which data are accepted in confidence and may not be published are indicated by 'No.'

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 8

Primary products from petroleum and natural gas for chemical conversion: Directory of manufacturers, alphabetical by code, 1988

Code	*Name of company*	*Code*	*Name of company*
AMO	Amoco Corp.	LYP	Lyondell Petrochemical Co.
ASH	Ashland Oil, Inc., Ashland Petroleum Co.	MCB	Borg-Warner Corp., Borg-Warner Chemicals
ATR	Atlantic Richfield Co., Arco Chemical Co.	MER	Merichem Co.
BAS	BASF Corp.	MOC	Marathon Petroleum Co., Texas Refining Div.
BFG	B. F. Goodrich Co., B.F. Goodrich Chemical Group	NES	Ruetgers-Nease Chemical Co.
CCP	Crown Central Petroleum Corp.	OMC	Olin Corp.
CED	Cedar Chemical Co.	PAS	Pennwalt Corp.
CGO	Citgo Petroleum Corp.	PLC	Phillips 66 Co.
CLK	Clark Oil & Refining Corp.	PPR	Phillips Puerto Rico Core, Inc.
CNE	Cain Chemical, Inc.	PPS	P/P Splitter Venture
CPS	CPS Chemical Co., Inc.	PPX	Phillips Paraxylene, Inc.
CSD	Fina Oil & Chemical Co., Cosden Chemical Div.	PSG	PMC Specialities Group, Inc.
CSP	Coastal Refining & Marketing, Inc.	RH	Rohm & Haas Co.
CXI	Chemical Exchange Industries, Inc.	SHC	Shell Oil Co., Shell Chemical Co.
DA	Diamond Shamrock Refining & Marketing	SHO	Shell Oil Co.
DOW	Dow Chemical Co.	SIO	BP Oil Company
DUP	E. I. duPont de Nemours & Co., Inc. Petrochemicals Dept.	SM	Mobil Oil Corp: Gas Liquids Dept. Mobil Chemical Co., Petrochemicals Div.
	Eastman Kodak Co.:	SOC	Chevron Corp., Chevron Chemical Co.
EKT	Tennessee Eastman Co. Div.	SOG	Hill Petroleum Company
EKX	Texas Eastman Co. Div.	SUN	Sun Company, Inc.
ELP	Rexene Products Company	SWR	Southwestern Refining Co., Inc.
ENJ	Exxon Chemical Americas	TCR	Texas City Refining, Inc.
GRS	Champlin Petroleum Co.	TNA	Ethyl Corp.
GYR	Goodyear Tire & Rubber Co.	TOC	Tenneco Oil Co.
HAP	National Gas Odorizing, Inc.	TPC	Texas Petrochemicals Corp.
HCL	Hoechst Celanese Corp. Bayport works	TU	Tenn-USS Chemicals Co.
		TX	Texaco Chemical Co.
HEC	Hewchem	UCC	Union Carbide Corp.
HES	Amerada Hess Corp. (Hess Oil Virgin Islands Corp)	UOC	Union Oil Co. of California
		UPM	UOP, Inc.
HKO	Occidental Chemical Corp., Olefins Div.	USI	Quatum Chemical Corp., USI Div.
HMY	Humphrey Chemical Co.	UTP	Union Texas Petroleum
KHI	Koch Refining Co.	VLR	Valero Refining Co.
KLM	Kalama Chemical, Inc.	VST	Vista Chemical Co.

Note.—Complete names, telephone numbers, and addresses of the above reporting companies are listed in app. A.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission

Section 3

Cyclic Intermediates

Cyclic intermediates are synthetic organic chemicals derived principally from petroleum and natural gas and from coal-tar crudes produced by destructive distillation (pyrolysis) of coal. Most cyclic intermediates are used in the manufacture of more advanced synthetic organic chemicals and finished products, such as dyes, medicinal chemicals, elastomers (synthetic rubber), pesticides, and plastics and resin materials. Some intermediates, however, are sold as end products without further processing. For example, refined naphthalene may be used as a raw material in the manufacture of 2-naphthol or of other more advanced intermediates, or may be packaged and sold as a moth repellant or as a deodorant. In 1988, about 45 percent of the total output of cyclic intermediates was sold; the rest was consumed chiefly in the producing plants in the manufacture of more advanced intermediates and finished products.

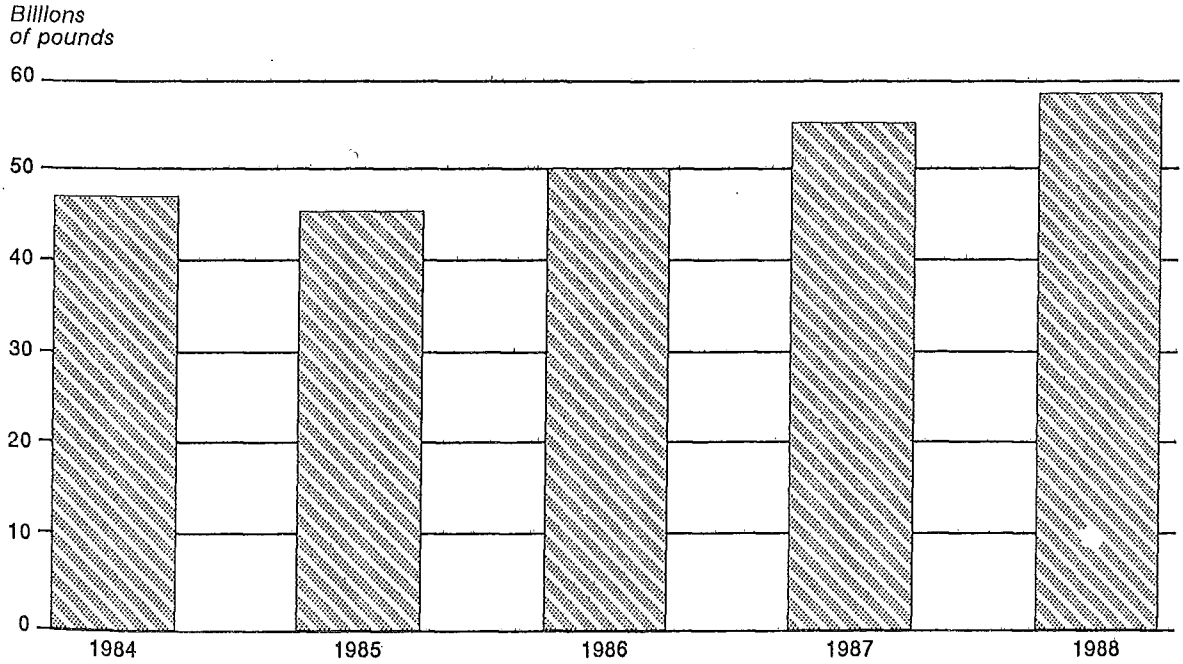
The total annual production of cyclic intermediates during 1984–88 is shown in figure 4. Total production of cyclic intermediates in 1988 amounted to 58,405 million pounds, an increase of 6 percent compared with production reported to the Commission in 1987. Reported sales of cyclic intermediate chemicals in 1988 were 26,491 pounds, valued at $9,369 million, compared with 23,206 million pounds, valued at $7,562 million, in 1987.

Intermediates that were produced in excess of 1 billion pounds in 1988 were terephthalic acid and terephthalic acid dimethyl ester (10,234 million pounds), ethylbenzene (9,929 million pounds), styrene (8,985 million pounds), p-xylene (5,601 million pounds), cumene (4,455 million pounds), phenol (3,562 million pounds), cyclohexane (2,297 million pounds), bisphenol A (1,340 million pounds), cyclohexanone (1,057 million pounds), and aniline (1,029 million pounds). These intermediate chemicals produced in excess of 1 billion pounds accounted for about 83 percent of the total output of cyclic intermediate chemicals produced in 1988.

Table 10 lists the products reported in this section and indicates the manufacturer(s) of each by code. These codes are identified by company name in table 11.

Ed Matusik
202–252–1356

Figure 4
Cylic Intermediates: U.S. production, 1984-88



Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 9
Cyclic intermediates: U.S. production and sales, 1988

Cyclic intermediates	Production	Sales Quantity	Sales Value	Average Unit value[1]
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Grand total	58,404,663	26,490,507	9,369,068	$0.35
4-Amino-5-methoxy-2-methylbenzenesulfonic acid (5-methyl-o-anisidinesulfonic acid)	1,758	(2)	(2)	(2)
p-[(p-Aminophenyl)azo]benzenesulfonic acid	252	(2)	(2)	(2)
Aniline (Aniline oil)	1,029,189	677,900	182,154	.27
Anilinomethanesulfonic acid and salt	478	(2)	(2)	(2)
Biphenyl	60,521	23,702	6,850	.29
Chlorobenzene, mono-	270,711	94,614	26,621	.28
Cresols and cresylic acid[3]	82,349	72,147	48,463	.67
Cumene	4,454,525	2,792,735	531,369	.19
Cyclohexane	2,296,732	2,129,326	404,723	.19
Cyclohexanone	1,057,281	157,002	75,463	.48
Dicyclopentadiene (including cyclopentadiene)	130,410	107,266	22,306	.21
2,4-(and 2,6-)Dinitrotoluene	981,606	(2)	(2)	(2)
Ethylbenzene	9,929,277	253,017	73,118	.29
Isocyanic acid derivatives, total	1,706,967	1,430,295	1,188,016	.83
Diphenylmethane-4,4'-diisocyanate (MDI)	364,963	(2)	(2)	(2)
Polymethylene polyphenylisocyanate	589,176	472,146	381,297	.81
Toluene-2,4- and 2,6-diisocyanate (80/20 mixture)	741,573	638,085	548,464	.86
All other isocyanic acid derivatives	11,255	320,064	258,255	.81
4,4'-Isopropylidenediphenol (Bisphenol A)	1,340,167	422,221	230,301	.55
o-Nitroaniline	8,366	(2)	(2)	(2)
Nonylphenol	201,220	98,325	46,172	.47
Octylphenol	41,964	(2)	(2)	(2)
Phenol, total	3,561,734	1,576,263	601,255	.38
From cumene	2,862,753	1,257,791	472,121	.38
All other phenol	698,981	318,472	129,134	.41
Phthalic anhydride	998,515	575,018	167,669	.29
Salicylic acid, tech	28,186	(2)	(2)	(2)
Styrene	8,984,474	3,783,186	1,619,678	.43
Terephthalic acid, dimethyl ester[4]	10,233,949	(2)	(2)	(2)
Tetrahydrofuran	93,804	(2)	(2)	(2)
o-Xylene	970,549	1,077,217	178,348	.17
p-Xylene	5,601,185	3,378,425	734,134	.22
All other cyclic intermediates	4,338,494	7,841,848	3,232,428	.41

[1] Calculated from unrounded figures.
[2] Reported data were accepted in confidence and may not be published, or no data were reported.
[3] Does not include data for coke oven and gas-retort ovens.
[4] The figure for terephthalic acid, dimethyl ester (DMT) includes both the acid itself and the dimethyl ester without double counting. The acid production figure was multiplied by the factor 1.16 to convert it to equivalent DMT.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 10

Cyclic intermediates for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Cyclic intermediates	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 11)*
Cyclic		
Acetoacetanilide	No	BRD, EKT.
o-Acetoacetanisidide	No	BRD, EKT.
o-Acetoacetotoluidide	No	BRD, EKT, HCL.
2',4'-Acetoacetoxylidide	No	EKT.
Acetoacet-m-xylidide	No	BRD.
Acetoguanamine	No	DIX(E).
1'-Acetonaphthone	No	GIV.
Acetophenone, tech	No	S.
p-Acetotoluidide	No	EK.
2-Acetylpyridine	No	RIL.
Adamantane	No	DIX(E).
Aldadiene	No	SRL.
Alkylbenzenes:		
Alkylbenzene straight-chain (except dodecyl and tridecyl)	No	MON, PLC.
Dodecylbenzene (including tridecylbenzene):		
Dodecylbenzene, straight-chain	No	MON, VST.
Dodecylbenzene, other	No	MON.
Alkylphenols, mixed	No	PSG.
Alkylpyridines, mixed	No	RIL, (2).
Aluminum chlorohydroxyphthalocyanine blue	No	PHC.
4'-Aminoacetanilide (Acetyl-p-phenylenediamine)	No	HCL.
3'-Amino-p-acetanisidide	No	HCL, SDC.
3-Amino-p-anisanilide	No	PSG.
1-Aminoanthraquinone and salt	No	SDC.
p-Aminobenzamide	No	NSC.
1-Amino-4-benzamidoanthraquinone	No	(2).
3'-Aminobenzanilide	No	HCL.
o-Aminobenzenethiol	No	FMT.
p-Aminobenzoic acid, tech	No	NSC, WYK.
2-Amino-6-benzothiazolesulfonic acid	No	VPC.
2-Amino-1-bromo-3-chloroanthraquinone	No	PLC.
1-Amino-4-bromo-9,10-dihydro-9,10-dioxo-2-anthracenesulfonic acid and sodium salt	No	VPC.
7-Aminocephalosporanic acid	No	BRS, TRD.
2-Amino-5-chloro-4-ethylbenzene	No	TCH.
2-Amino-5-chloropyridine	No	RIL.
6-Amino-5-chloro-m-toluenesulfonic acid [SO_3H=1] (2B Acid)	No	DUP, PHC.
6-Amino-2,4-dichloro-3-methylphenol	No	EKT.
4-Amino-N,N-di(β-hydroxyethyl)aniline sulfate	No	WAY.
4-Amino-5-methoxy-2-methylbenzenesulfonic acid (5-methyl-o-anisidinesulfonic acid)	Yes	PSG, VPC, (2).
m-[(4-Amino-3-methoxyphenyl)azo]benzenesulfonic acid	No	VPC.
3-[(4-Amino-5-methoxy-o-tolyl)azo]-1,5-naphthalene-disulfonic acid	No	RUC.
2-Amino-2-methylpropyl 8-bromotheophyllinate	No	CHT.
2-Amino-4-methylpyridine	No	RIL.
2-Amino-5-methylpyridine	No	RIL.
2-Amino-4-methylpyrimidine (2-Amino-4-methyl-1,3-diazine)	No	RIL.
3-Amino-2,7-naphthalenedisulfonic acid	No	NES.
2-(4-Amino-2-nitroanilino)ethanol	No	SOM.
2-Amino-4-nitrophenol	No	SOM.
2-[(2-Amino-4-nitrophenyl)amino]-2-hydroxymethyl-1,3-propanediol	No	SOM.
2-Amino-5-nitrothiazole	No	PCW.
2-Amino-4-nitrotoluene hydrochloride	No	PCW.

See footnotes at end of table.

Table 10—Continued

Cyclic intermediates for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Cyclic intermediates	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 11)*
Cyclic—Continued		
3-Amino-2-oxazolidinone	No	BRS.
5-Amino-2-[(2-oxo-5-benzimidazolinyl)amino]-benzenesulfonic acid	No	PFZ.
p-Aminophenol	No	MAL.
p-[(p-Aminophenyl)azo]benzenesulfonic acid	Yes	ATL, CGY, VPC.
7-[(4-Aminophenyl)azo]-1,3-naphthalenedisulfonic acid	No	ACY.
2-Aminopyridine	No	RIL.
2-Aminothiazole nitrate	No	PCW.
4-Amino-m-toluenesulfonic acid [SO_3H=1]	No	DUP.
6-Amino-m-toluenesulfonic acid [SO_3H=1]	No	DUP, PHC.
Amylphenols, mixed isomers	No	PSG.
Aniline (Aniline oil)	Yes	ART, DUP, FST, ICI, MAL, RUC, USR.
2-Anilinoethanol	No	TCH.
Anilinomethanesulfonic acid and salt	Yes	ACY, ATL, CGY, VPC.
o-Anisidinomethanesulfonic acid	No	CGY, VPC.
Anisole, tech	No	CHF.
Anisoyl chloride	No	SD.
Anthranilic acid (o-Aminobenzoic acid)	No	PSG.
N,N'-(1,5-Anthraquinonylene)dianthranilic acid	No	SDC.
Benzaldehyde, tech	No	KLM.
Benzanilide	No	EK.
Benzenesulfonic acid	No	UPF.
Benzenesulfonic acid, 2-formyl-, sodium salt	No	(2).
Benzenesulfonyl chloride	No	ICI, UPF.
1,2,4-Benzenetricarboxylic acid, 1,2-dianhydride (Trimellitic anhydride)	No	AMO.
Benzhydrol (Diphenylmethanol)	No	PD.
Benzimidazole	No	EK.
1,3-Benzodioxole	No	AMB.
Benzoic acid, 2-[4-(dimethylamino)-benzoyl]	No	(2).
Benzoic acid, methyl ester	No	HCF.
Benzoic acid, tech	No	KLM, PFZ, VEL.
Benzonitrile	No	PSG.
2-Benzothiazolethiol, sodium salt	No	BFG, BKM, USR.
1H-Benzotriazole	No	PSG.
2-Benzoxazolethiol	No	EK.
Benzoyl chloride	No	HK, VEL.
Benzylamine	No	HXL, KLM.
2-(Benzylamino)ethanol	No	HXL.
5-(Benzylethylamino)-o-toluenesulfonic acid	No	HXL.
2-Benzyl-2'-hydroxy-5,9-dimethyl-6,7-benzomorphanhydrobromide	No	SD.
1-Benzyl-4-phenylisonipecotic acid	No	SDW.
Benzyltrichloroacetimidate	No	OMC.
Benzyltriethylammonium chloride	No	HXL.
Benzyltrimethylammonium hydroxide	No	RSA.
Biphenyl	Yes	KHI, MON, SOC, TCC.
1,4-Bis(3-aminopropyl)piperazine	No	TX.
2,6-Bis(p-azidobenzylidene)-4-methylcyclohexanone	No	(2).
N,N-Bis(2-hydroxyethyl)aniline	No	TCH.
N,N-Bis((4-methylphenyl)sulfonyl)amine, potassium salt	No	EK.
1,2-Bis(tribromophenoxy)ethane	No	GTL.
Bromobenzene,mono	No	DAZ, GTL.
o-Bromobenzoic acid	No	PD.
4-Bromo-3,5-dihydroxybenzamide	No	PCW.
4-Bromo-3,5-dihydroxybenzoic acid	No	PCW.
2-Bromo-4,6-dinitroaniline	No	HCL.
1-Bromo-4-ethoxy-2-methylbenzene	No	(2).

See footnotes at end of table.

Table 10—Continued

Cyclic intermediates for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Cyclic intermediates	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 11)*
Cyclic—Continued		
2-Bromopyridine	No	DAZ.
Butyl p-aminobenzoate	No	WYK.
p-Butylaniline	No	TNA.
p-tert-Butylbenzaldehyde	No	GIV.
n-Butylbenzene	No	PLC.
2-tert-Butyl-p-cresol	No	PSG.
6-tert-Butyl-o-cresol	No	PSG.
tert-Butyldiphenylchlorosilane	No	GGI, NOD.
2-[(1-Butyl-2-methylindol-3-yl]carbonylbenzoic acid	No	(2).
o-sec-Butylphenol	No	SCN, TNA.
o-tert-Butylphenol	No	TNA.
p-sec-Butylphenol	No	SCN.
p-tert-Butylphenol	No	SCN.
Butylphenols, mixed	No	PSG, SCN, (2).
p-tert-Butyltoluene	No	GIV.
6-tert-Butyl-2,4-xylenol	No	GAF, PSG.
4,4'-Carbonylbis[phthalic anhydride]	No	ACH.
N-Carboxy-N-methylanthranilic anhydride	No	(2).
4'-Chloroacetophenone	No	LIL.
2-Chloro-4-aminotoluene	No	LMC.
o-Chloroaniline	No	DUP, LMC.
p-Chloroaniline	No	DUP.
p-Chlorobenzaldehyde	No	PD.
Chlorobenzene, mono	Yes	MON, PPG, SCC.
p-Chlorobenzenesulfonic acid	No	UPF.
2-Chloro-1,4-dibutoxybenzene	No	ALL.
1-Chloro-2,5-dibutoxy-4-nitrobenzene	No	ALL.
2-Chloro-1,4-diethoxybenzene	No	ALL.
1-Chloro-2,5-diethoxy-4-nitrobenzene	No	ALL.
4'-Chloro-2',5'-dimethoxyacetoacetanilide	No	HCL.
2-Chloro-1,4-dimethoxybenzene	No	CHF.
2-Chloro-4,6-dimethylaniline	No	EKT.
1-Chloro-2,4-dinitrobenzene (Dinitrochlorobenzene)	No	SDC.
3-Chlorodiphenylamine	No	SK.
p-[(2-Chloroethyl)methylamino]benzaldehyde	No	VPC.
1-Chloro-2-nitrobenzene (Chloro-o-nitrobenzene)	No	DUP, MON.
1-Chloro-4-nitrobenzene (Chloro-p-nitrobenzene)	No	DUP, MON.
2-Chloro-4-nitrobenzoic acid	No	SAL.
2-Chloro-4-nitrobenzoic acid, potassium salt	No	SAL.
4-Chloro-3-nitrobenzotrifluoride	No	DAZ.
2-Chloro-4-nitrotoluene	No	DUP, PCW.
2-Chlorophenothiazine	No	SK.
o-Chlorophenylcyclopentyl ketone	No	PD.
N-(4-Chlorophenyl)-N'-(3,4-dichlorophenyl)urea	No	VPC.
4-Chloro-o-phenylenediamine	No	FMT.
4-Chlorophthalic acid	No	PSG.
1-(3-Chloropropyl)-4-methylpiperazine	No	SK.
3-Chloropropyl-2,5-xylyl ether	No	PD.
2-Chloropyridine	No	OMC.
4-Chlororesorcinol	No	PCW.
5-Chlorosalicylic acid	No	PCW.
2-(4-Chlorosulfonylphenyl)ethyltrichlorosilane	No	NOD.
7-Chloro-1,2,3,4-tetrahydro-2-methyl-3-(2-methylphenyl)-4-oxo-6-quinozolenesulfonamide	No	(2).
o-Chlorotoluene	No	S.
α-Chlorotoluene (Benzyl chloride)	No	MON.
3-Chloro-p-toluidine [NH_2=1]	No	DUP.
3-(2-Chloro-4-trifluoromethylphenoxy)toluene	No	(2).

See footnotes at end of table.

Table 10—Continued

Cyclic intermediates for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Cyclic intermediates	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 11)*
Cyclic—Continued		
4-Chloro-α,α,α-trifluoro-3-nitrotoluene	No	PCW.
p-Chloro-α,α,α-trifluorotoluene	No	HK.
6-Chloro-α,α,α-trifluoro-m-toluidine	No	PCW.
4-Chloro-3,5-xylenol	No	FER.
Copper, [2,2',2'',2'''-[z9H,31H-phthalacyaninepentyl-pentakis(methylene)]pentakis[1H-isoindole-1,3(2H)-dionato]]	No	(2).
Cresols:		
m-Cresol	No	MER.
o-Cresol:		
o-Cresol, from petroleum	No	GE, MER, NPC, PSG.
p-Cresol	No	MER, PSG.
Cresols, mixed:		
(m,p)-Cresol:		
(m,p)-Cresol, from petroleum	No	MER, PSG.
Cresylic acid, refined:		
Cresylic acid, refined; from petroleum	No	MER, NPC, PSG.
Cumene (isopropyl benzene)	Yes	ASH, BTL, GGC, GRS, KHI, SHC, SOC, TX.
Cumenesulfonic acid	No	NES.
4-(Cyanoacetyl)morpholine	No	DUP.
N-Cyano-s-methyl-N-2(4-methyl-5-imidazolyl)-methylthioethylisothiourea	No	SK.
Cyclohexane	Yes	GRS, PLC, PPR, SOC, SUN, TX, UOC.
1,4-Cyclohexanedicarboxylic acid	No	EKT.
1,2-Cyclohexanedicarboxylic acid anhydride	No	BCC.
Cyclohexanol	No	ACS, BAS, DUP, MON.
Cyclohexanone	Yes	ACS, BAS, CNP, DUP, MON, UCC.
Cyclohexanone oxime	No	CNP.
Cyclohexene	No	USR.
4-Cyclohexene-1,2-dicarboxylic anhydride	No	DKA.
Cyclohexene oxide	No	USR.
β-(1-Cyclohexenyl)ethylamine	No	HXL.
Cyclohexylamine	No	AIP, HCL.
Cyclohexylmethyldimethoxysilane	No	NOD.
Cyclooctadiene	No	DUP.
(2-Cyclopenten-1-yl)-2-propanone	No	GAF.
Cyclopropene carboxylic acid, 3-(2-chloro-3,3,3-trifluoro-1-propenyl)-2,2-dimethyl-(2-methyl[1,1'-biphenyl]-3-yl) methyl ester	No	NES.
2-Cyclopropylmethylamino-5-chlorobenzophenone	No	PD.
2-(N-Cyclopropylmethyl-N-phthalimidoacetyl)-amino-5-chlorobenzophenone	No	PD.
p-Cymene	No	HPC.
3-Diacetoxyethylaminobenzanilide	No	HCL.
Dialkylbenzene	No	VST.
1,3 Diaminocyclohexane	No	DUP.
4,4'-Diaminodiphenyl sulfone	No	TLI.
2,6-Diaminopyridine	No	RIL.
2,5-Dianilinoterephthalic acid	No	VPC.
m-Dibromobenzene	No	DAZ.
(1,2-Dibromoethyl)benzene	No	DAZ.
Dibromoethyldibromocyclohexane	No	TNA.
2,6-Dibromo-4-nitroaniline	No	HCL.
p-Dibutoxybenzene (DBB)	No	ALL.
2,5-Dibutoxy-4-morpholinobenzenediazonium sulfate salt (DBB Sulfate)	No	ALL.
2,5-Dibutoxy-4-morpholinonitrobenzene	No	ALL.
2-([4-Dibutylamino-2-hydroxy]carbonyl)benzoic acid	No	(2).

See footnotes at end of table.

Table 10—Continued

Cyclic intermediates for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Cyclic intermediates	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 11)*
Cyclic—Continued		
3-(Dibutylamino)phenol	No	(2).
Dibutyl-p-cresol	No	PSG.
2,4-Di-tert-butylphenol	No	PSG, SCN.
2,6-Di-tert-butylphenol	No	TNA.
2,6-Di-tert-4-sec-butylphenol	No	CED.
3,4-Dichloroaniline	No	DUP.
o(and p)-Dichlorobenzene	No	SCC.
o-Dichlorobenzene	No	MON, PPG, SCC, SOI.
m-Dichlorobenzene	No	MON.
p-Dichlorobenzene	No	PPG, SCC, SOI.
3,3'-Dichlorobenzidine base and salts	No	CWN, LMC.
3,4-Dichlorobenzotrifluoride	No	HK, (2).
3,5-Dichlorobenzoyl chloride	No	HK.
4,6-Dichloro-1,3-dihydroxybenzene	No	PCW.
Dichlorodiphenylsilane	No	DCC.
2,6-Dichloro-3-methylaniline	No	SDC.
Dichloromethylphenylsilane	No	DCC.
2,6-Dichloro-4-nitroaniline	No	CWN.
1,2-Dichloro-4-nitrobenzene	No	DUP.
2,4-Dichloro-5-nitrotrifluoromethylbenzene	No	DAZ.
(E)-3-(2,4-Dichlorophenyl)-2-(2-nitro-4-trifluoromethylphenyl)propenoic acid	No	SK.
2,6-Dichloropyridine	No	OMC.
p-α-Dichlorotoluene	No	HK.
Dicyclohexylamine	No	AIP.
Dicyclohexylamine, nitrate salt	No	OMC.
Dicyclopentadiene (includes Cyclopentadiene)	Yes	DOW, ENJ, LYP, SHC, VEL.
α,α-Diethoxyacetophenone	No	CWN.
p-Diethoxybenzene	No	ALL.
2,5-diethoxy-4-morpholinonitrobenzene	No	ALL.
p-(Diethylamino)benzaldehyde	No	VPC.
2-[4-Diethylamino-2-hydroxybenzylbenzoic acid]	No	(2).
4-(Diethylamino)-2-methylbenzaldehyde	No	(2)).
3-[(4'-N,N-Diethylamino)phenylazo]-1H-1,2,4-triazole	No	ACY.
3-(Diethylamino)propiophenone	No	TCH.
N,N-Diethylaniline	No	BCC, DUP.
2,6-Diethylaniline	No	TNA.
Diethylbenzene	No	DOW, UPM.
N,N-Diethylcyclohexylamine	No	AIP.
3,5-Diethyl-1,2-dihydro-1-phenyl-2-propylpyridine	No	RIL.
N,N-Diethyl-p-phenylenediamine	No	EK.
3,5-Diethyltoluene-2,4-diamine	No	TNA.
N,N-Diethyl-m-toluidine	No	DUP.
N,N-Diethyl-p-toluidine	No	RSA.
6,11-Dihydrodibenz(b,e)oxepin-11-one	No	PFZ.
2,3-Dihydro-2,2-dimethyl-7-benzofuranol	No	FMN.
2-[2-(2,3-Dihydro-1,3-dioxo-1H-inden-2yl)-(quinolinyl)]-6-methylbenzothiazole-7-sulfonic acid	No	VPC.
2,3-Dihydro-2-[6-methyl-7-sulfo-2-benzothiazolyl]-2-quinolinyl-1,3-dioxo-1H-indene-5-carboxylic acid	No	VPC.
2,4-Dihydroxybenzaldehyde	No	EK.
3,4-Dihydroxybenzoic acid, methyl ester	No	PCW.
2,4-Dihydroxybenzophenone	No	ACY.
N,N-Di(β-hydroxyethyl)-m-chloroaniline	No	MIL.
6,7-Dihydroxy-2-naphthalenesulfonic acid	No	CCC.
Diisobutyl-o-cresol	No	PSG.
m-Diisopropenylbenzene	No	EKT.
Diisopropylaniline	No	TNA.

See footnotes at end of table.

Table 10—Continued

Cyclic intermediates for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Cyclic intermediates	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 11)*
Cyclic—Continued		
Diisopropylbenzene	No	EKT, GGC.
2,5-Dimethoxybenzaldehyde	No	CWN.
m-Dimethoxybenzene	No	ACY.
p-Dimethoxybenzene	No	CHF.
m-(Dimethylamino)benzoic acid	No	HIL.
2-[4-(Dimethylamino)benzoyl]benzoic acid	No	EK.
m-Dimethylaminophenol	No	ACY, ALD, BCC.
11-[3(Dimethylamino)propyl]-6H-hydroxydibenz (b,e)oxepin	No	PFZ.
N,N-Dimethylaniline	No	DUP.
2,6-Dimethylaniline	No	TNA.
N,N-Dimethylbenzylamine	No	ARS, HXL.
Dimethyl-1,4-cyclohexanedicarboxylate	No	EKT.
N,N-Dimethylcyclohexylamine	No	AIP.
4,4'-Dimethyldiphenyl ether	No	TNA.
5,5-Dimethylhydantoin	No	BRD.
2,6-Dimethylnaphthalene	No	UPM.
N,N'-Dimethyl-3,4,9,10-perylenetetracarboxylic acid 3, 4:9,10-diimide	No	VPC.
N,N-Dimethyl-o-toluidine	No	RSA.
N,N-Dimethyl-p-toluidine	No	FST, RSA.
m-Dinitrobenzene	No	DUP, FST.
2,4-Dinitrobenzenesulfonic acid, sodium salt	No	EK.
3,5-Dinitrobenzoic acid	No	SAL.
3,5-Dinitrobenzoyl chloride	No	(2).
3,5-Dinitrochlorobenzenesulfonic acid, potassium salt	No	LMC.
2,4-Dinitrophenol, tech	No	SDC.
2,4-Dinitrophenoxyethanol	No	OMC.
3,5-Dinitrosalicylic acid, methyl ester	No	SAL.
p-Dinitrosobenzene	No	LC.
4,4'-Dinitrostilbene-2,2'-disulfonic acid	No	CGY.
2,4-Dinitrotoluene	No	DUP.
2,4(and 2,6)-Dinitrotoluene	Yes	ICI, MOB, RUC, (2).
3,5-Dinitro-p-toluenesulfonic acid	No	GAF, SCN.
3,5-Dinitro-o-toluic acid	No	SAL.
Dinonylhydroxybenzenesulfonic acid	No	(2).
Dinonylphenol	No	TX.
Di-para-benzoquinone dioxime	No	LC.
2,4-Di-tert-pentylphenol	No	PAS.
Diphenylamine	No	ART, RUC, USR.
Diphenyldimethoxysilane	No	NOD.
Diphenyldisulfide	No	PAH.
1-Diphenylhydrazone	No	EKT.
Diphenyl phthalate	No	EK.
1,3-Di-4-piperidylpropane	No	RIL.
2,5-Di-p-toluidinoterephthalic acid	No	VPC.
1,5-Diureidonaphthalene	No	SOI.
Divinylbenzene	No	DOW, JSC.
1,1-Di-3,4-xylylethane	No	ACH.
Dodecylnitrobenzene	No	LMC.
p-Dodecylphenol	No	GAF, MON, SOC.
5-Ethanoxy-3-trichloromethyl-1,2,4-thiadiazole	No	OMC.
Ethisterone	No	SRL, UPJ.
1-Ethoxy-3-methylbenzene	No	(2).
4-Ethoxy-2-methyl-N-phenylaniline	No	(2).
o-Ethylaniline	No	TNA.
N-Ethylaniline, refined	No	BCC, FST.
2-(N-Ethylanilino)ethanol	No	TCH.
3-(N-Ethylanilino)propionitrile	No	TCH.

See footnotes at end of table.

Table 10—Continued

Cyclic intermediates for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Cyclic intermediates	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 11)*
Cyclic—Continued		
α-(N-Ethylanilino)-m-toluenesulfonic acid	No	HIL.
Ethylbenzene	No	AMO, ATR, CSD, DOW, ELP, HCL, KHI, MCB, SOC, SOG.
2-(N-Ethyl-N, β-cyanoethyl)-4-acetaminoanisole	No	TCH.
6-Ethyl-2-methylaniline	No	TNA.
2-[Ethyl(3-methylphenyl)amino]ethanol	No	FST.
Ethyl 2(2-nitro-4-trifluoromethylphenyl)-3-oxobutanoate	No	SK.
N-Ethyl-N-phenylbenzylamine	No	HIL.
3-Ethylpyridine	No	RIL.
5-Ethyl-2,3-pyridinedicarboxylic acid	No	NES.
N-Ethyl-m-toluidine	No	DUP, FST.
3-(N-Ethyl-m-toluidino)propionitrile	No	TCH.
1-Ethynyl-1-cyclohexanol	No	OMC.
9-Fluorenone	No	MCK.
1-Formylpiperidine	No	RIL.
Furan	No	QKO.
Furfuryl alcohol	No	QKO.
Furfurylamine	No	HXL.
1-(2-Furoyl)piperazine	No	PFZ.
Hexachlorocyclopentadiene	No	VEL.
1,4,5,6,7,7-Hexachloro-5-norbornene-2,3-dicarboxylic anhydride (Chlorendic anhydride)	No	VEL.
Hexamethyleneimine	No	CXI, DUP.
Hydroquinone, tech	No	EKT, GYR.
p-Hydroxybenzaldehyde	No	WES.
p-Hydroxybenzenesulfonic acid	No	UPF.
p-Hydroxybenzoic acid	No	LEM.
4-Hydroxy-2H-1,2-benzothiazine-3-carboxylic acid, methyl ester, 1,1-dioxide	No	PFZ.
4-Hydroxybenzylbenzene	No	TNA.
2'-Hydroxy-5,9-dimethyl-6,7-benzomorphan	No	SD.
2,2'-[[4-(2-Hydroxyethylamino)-3-nitrophenyl]imino]-diethanol	No	SOM.
3-[N-(2-Hydroxyethyl)anilino]propionitrile	No	TCH.
N-β-Hydroxyethyl-2,4-dihydroxybenzamide	No	PCW.
4-Hydroxy-2-methyl-2H-1,2-benzothiazine-3-carboxylic acid, methyl ester, 1,1-dioxide	No	PFZ.
2-Hydroxymethylene-17α-ethinylandrost-17β-ol-4-en-3-one	No	SD.
3-Hydroxy-N-(3-N-morpholino-γ-propyl)-2-naphthimide	No	PCW.
6-Hydroxy-2-naphthalenesulfonic acid, sodium salt	No	HIL.
1-Hydroxy-2-naphthoic acid	No	PCW.
3-Hydroxy-2-naphthoic acid (B.O.N.)	No	PCW.
3-Hydroxy-2-naphthoic acid, ethanolamide	No	PCW.
1-Hydroxynaphthoic acid, methyl ester	No	PCW.
3-Hydroxy-2-naphthoic acid, methyl ester	No	PCW.
3-Hydroxy-2-naphthoic acid, sodium salt	No	PCW.
1-Hydroxy-6-octadecyloxy-2-naphthoic acid	No	(2).
p-Hydroxyphenylglycine potassium methyl dane salt	No	KAN.
5-Indanol	No	(2).
Isatoic anhydride	No	PSG.
Isobutylbenzene	No	PLC, TNA.
Isobutyrophenone	No	ARS.
Isocyanic acid derivatives:		
Bitolylene diisocyanate (TODI)	No	CWN.
Diphenylmethane-4,4'-diisocyanate (MDI)	Yes	BAS, DOW, ICI, MOB, RUC.
Polymethylene polyphenylisocyanate	Yes	BAS, ICI, MOB, RUC.
Toluene 2,4-diisocyanate	No	MOB.
Toluene 2,4-and 2,6-diisocyanate (80/20 mixture)	Yes	BAS, DOW, ICI, MOB, OMC, RUC.
Toluene 2,4-and 2,6-diisocyanate (65/35 mixture)	No	MOB.
p-Toluenesulfonyl isocyanate	No	CWN.

See footnotes at end of table.

Table 10—Continued

Cyclic intermediates for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Cyclic intermediates	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 11)*
Cyclic—Continued		
Isonicotinic acid	No	RIL.
Isonicotinonitrile	No	RIL.
Isophthalic acid (Benzene-1,3-dicarboxylic acid)	No	AMO.
Isophthalic acid, dimethyl ester	No	UTC.
Isophthalonitrile	No	DUP, PSG.
Isophthaloyl chloride	No	DUP, TLC.
Isopropylbiphenyl	No	TCC.
5,5'-Isopropylidenebis(2-hydroxy-m-xylene-α,α'-diol)	No	ARK.
4,4'-Isopropylidenediphenol (Bisphenol A)	Yes	ART, DOW, GE, SHC.
4,4'-Isopropylidenediphenol, ethoxylated	No	ICI.
4,4'-Isopropylidenediphenol, propoxylated	No	ICI.
o-Isopropylphenol	No	FMC, TNA.
Isopropylphenol, mixed	No	PSG.
2,6-Lutidine	No	RIL.
Malonanilide	No	PCW.
Melamine	No	ACY, MLC.
dl-p-Mentha-1,8-diene (Limonene)	No	ARZ, NCI.
N-(2-Methoxy-1-naphthyl)acetamide	No	SDC.
(p-Methoxyphenyl)acetic acid	No	HEX.
2-(N-Methylanilino)ethanol	No	TCH.
3-(N-Methylanilino)propionitrile	No	TCH.
2-Methylanthraquinone	No	ACY.
Methyl-2-benzimidazole carbamate	No	CED.
4-Methylbenzotriazole	No	VPC.
o-Methylbenzoyl chloride	No	TLC.
N-Methylbenzylamine	No	HXL.
o-Methylbenzyl chloride	No	ICI.
Methyl benzyl ether	No	GRS.
Methylcyclohexane	No	PLC.
Methyl 3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropane carboate	No	FMN.
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-o-cresol)	No	CPS.
4-Methyl-2,6-dinitrophenol	No	PSG.
N-Methyleneaniline	No	PCW.
4,4-Methylenebis(2,6-di-tert-butylphenol)	No	TNA.
4,4'-Methylenebis[N,N-diethylaniline]	No	ACY.
4,4'-Methylenebis[N,N-dimethylaniline] (Methane base)	No	ACY.
2,2'-Methylenebis(4-methyl-6-nonyl-p-cresol)	No	PSG.
4,4'-Methylenedianiline	No	RUC, USR.
Methylenedicyclohexylmethane 1,4-diisocyanate	No	MOB.
Methylene diphenylamine (polymeric)	No	MOB.
5,5'-Methylenedisalicylic acid	No	KLM.
Methyl p-formylbenzoate	No	EKT.
(2,4-Methyl-5-imidazolyl)methylthioethylamine dihydrochloride	No	SK.
2-Methylindole	No	(2).
4-Methyl-N-((4-methylphenyl)sulfonyl) benzenesulfonamide	No	EK.
Methyl nicotinate	No	RIL.
N-Methyl-p-nitroaniline	No	ACY, USR.
4-Methyl-2-nitroanisole	No	PSG.
3-Methyl-2-nitrobenzoic acid	No	SAL.
2-Methyl-5-norbornene-2,3-dicarboxylic anhydride	No	BCC.
2-Methyl-1-octyl-1	No	(2).
4-Methylphthalic acid	No	EK.
4-(4'-Methylpiperidine)pyridine	No	RIL.
α-Methylstyrene	No	GGC, TX.
ar-Methylstyrene (Vinyltoluene)	No	ART, BTL.

See footnotes at end of table.

Table 10—Continued

Cyclic intermediates for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Cyclic intermediates	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 11)*
Cyclic—Continued		
Mono-, di-, and triesters of phenyl (2,3,4-trihydroxyphenyl) methanone with 6-diazo-5,6-dihydro-5-oxo-1-naphthalenesulfonic acid	No	WAY.
Myristylbenzyldimethylammonium chloride.$2H_2O$	No	PCW.
1-Naphthaldehyde	No	GNW.
2-Naphthalenesulfonic acid	No	ACY, EK.
1-Naphthalenesulfonic acid, 8-(phenylamino)-monosodium salt	No	SDC.
2-Naphthalenesulfonic acid, sodium salt	No	GNW.
Naphthalimide	No	VPC.
1-Naphthylamine (α-Naphthylamine)	No	DUP.
p-(2-Naphthylamino)phenol (N-(p-Hydroxyphenyl)-2-naphthylamine)	No	SDC.
Nicotinonitrile (3-Cyanopyridine)	No	NEP, RIL.
3-Nitro-6-pyrrolodinyl toluene	No	ALL.
o-Nitroaniline	Yes	BUC, DUP, MON.
p-Nitroaniline	No	DUP, MON.
5-Nitroanthranilic acid	No	TLI.
1-Nitroanthraquinone	No	SDC.
p-Nitrobenzamide	No	PD.
Nitrobenzene	No	FST, ICI, MOB, RUC.
m-Nitrobenzenesulfonic acid, sodium salt	No	USM.
o-Nitrobenzoic acid	No	SAL.
m-Nitrobenzoic acid	No	HIL, SAL.
p-Nitrobenzoic acid	No	DUP.
m-Nitrobenzoic acid, sodium salt	No	SAL.
2-Nitro-N-benzoylaniline	No	SAL.
2-Nitro-p-cresol	No	PSG.
5-Nitrodimethylisophthalate	No	SAL.
Nitrodiphenylamine	No	ACY, MON.
5-Nitroisophthalic acid	No	LMC, SAL.
3-Nitro-4-methylacetophenone	No	TLI.
1-Nitronaphthalene	No	DUP.
p-Nitrophenethyl alcohol	No	PCW.
o-Nitrophenol	No	MON.
p-Nitrophenol	No	DUP, MON.
p-Nitrophenol, sodium salt	No	DUP.
2-Nitro-N'-phenyl-p-phenylenediamine	No	SOM.
5-Nitrosalicylaldehyde	No	EK.
p-Nitrosophenol	No	SDC.
4-Nitrosophenol, sodium salt	No	SDC.
o-Nitrotoluene	No	DUP, FST.
m-Nitrotoluene	No	DUP, FST.
p-Nitrotoluene	No	DUP, FST.
Nitrotoluene mixtures	No	FST.
(2-Nitro-4-trifluoromethylphenyl)acetic acid	No	SK.
Nonylphenol	Yes	GAF, KLM, MCB, MON, RH, SCN, TX.
2-Octanoylhydroquinone	No	EKT.
Octylphenol	Yes	PSG, RH, SCN.
Octylphenoxydiethoxy chloride	No	RH.
3-Oxo-1,2-benzisothiazoline-2-acetic acid, methyl ester, 1,1-dioxide	No	PFZ.
5-Oxo-1-phenyl-2-pyrazoline-3-carboxylic acid, ethyl ester	No	HCL.
Oxyaluminum benzoate	No	CHT.
4,4'-Oxydianiline	No	DUP.
Pentabromochlorocyclohexane	No	DOW.

See footnotes at end of table.

Table 10—Continued

Cyclic intermediates for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Cyclic intermediates	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 11)*
Cyclic—Continued		
o-Pentylphenol (o-Amylphenol)	No	(2).
p-tert-Pentylphenol	No	PAS, SCN.
Permethrin acid chloride	No	CED.
3,4,9,10-Perylenetetracarboxylic acid	No	PAS.
3,4,9,10-Perylenetetracarboxylic-3,4:9,10-dianhydride	No	VPC.
3,4,9,10-Perylenetetracarboxylic-3,4:9,10-diimide	No	VPC.
1,10-Phenanthroline	No	VNC.
2-Phenethylamine	No	HXL.
p-Phenetidine	No	HCL, MNA.
Phenol:		
Natural:		
From petroleum:		
Phenol, natural, from petroleum, U.S.P.	No	MER.
All other Phenol, natural, from petroleum	No	PSG.
Synthetic:		
Phenol, benzylated	No	MIL.
Phenol, styrenated	No	MIL, PSG.
Phenol, synthetic, from cumene by oxidation, U.S.P	Yes	ACS, ART, BTL, DOW, GE, GGC, TX.
Phenol, synthetic, from toluene by oxidation, U.S.P	No	KLM.
All other phenol, synthetic	No	SHC.
Phenolsulfonaphthalein, sodium salt	No	ART, EK.
Phenolsulfonic acid	No	PSG.
Phenolsulfonic acid, sodium salt	No	SAL.
Phenoxyacetic acid, sodium salt	No	NCC.
3-Phenoxybenzaldehyde	No	TNA.
3-Phenoxybenzaldehyde cyanohydrin	No	TNA.
3-Phenoxybenzenemethanol	No	TNA.
m-Phenoxytoluene	No	MER.
4'-Phenylacetophenone	No	ANG.
4-(Phenylazo)diphenylamine	No	EK.
2-Phenylbenzimide	No	SAL.
m-Phenylenebismaleimide	No	NES.
o-Phenylenediamine	No	DUP, PSG.
m-Phenylenediamine	No	DUP, FST.
p-Phenylenediamine	No	DUP.
Phenyl ether (Diphenyl oxide)	No	DOW, MON.
d(+)α-Phenylethylamine	No	HXL.
N-Phenylglycine	No	EK.
Phenylglycine, sodium salt	No	BCC, LIL.
2,2'-(Phenyl)iminodiethanol (N-Phenyldiethanolamine)	No	MIL, TCH.
2,2'-(Phenyl)iminodiethanol, diacetate ester	No	TCH.
Phenylmercuric carboxylate	No	COS.
o-Phenylphenol	No	DOW.
p-Phenylphenol	No	DOW.
o-Phenylphenol, sodium salt	No	DOW.
N-Phenyl-p-phenylenediamine	No	USR.
1-Phenyl-1,2-propanedione, 2-oxime	No	ORT.
4-Phenylpropylpyridine	No	RIL.
Phenyltriethoxysilane	No	NOD.
Phthalic acid	No	EK.
Phthalic anhydride	Yes	ART, BAS, ENJ, KPT, STP, TU, USR.
Phthalimide	No	PSG.
[Phthalocyaninato(2-)]copper	No	PHC.
[Phthalocyaninetetramethanaminato]copper	No	(2).
Phthalocyaninetetrasulfonyl chloride, copper derivative	No	VPC.
Phthaloyl chloride (Phthalyl chloride)	No	TLC.

See footnotes at end of table.

Table 10—Continued

Cyclic intermediates for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Cyclic intermediates	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 11)*
Cyclic—Continued		
Picolines:		
Picoline (3,4-mixture)	No	RIL.
2-Picoline (α-Picoline)	No	RIL.
3-Picoline (β-Picoline)	No	NEP, RIL.
4-Picoline (γ-Picoline)	No	RIL.
3-Picoline-N-oxide	No	RIL.
Picolinonitrile (2-Cyanopyridine)	No	NEP.
3-Picolylamine	No	RIL.
Picric acid (Trinitrophenol)	No	SDC.
Piperidine	No	AIP, RIL.
Polyethylbenzene (80 percent diethylbenzene)	No	ELP.
4-Propanolpyridine	No	RIL.
Propiophenone	No	ORT.
8,16-Pyranthrenedione	No	PCW.
1,3,6,8-Pyrenetetrasulfonic acid	No	(2).
2-Pyridinecarboxaldehyde	No	LC.
Pyridine, refined:		
2 Pyridine, refined	No	NEP.
Pyridine, refined all other grades	No	RIL.
Pyridine hydrochloride	No	RSA.
3-Pyridinemethanol	No	RIL.
2-Pyridinethiol-1-oxide, sodium salt	No	OMC.
2-Pyridinethiol-1-oxide, zinc salt	No	OMC.
4-Pyridylacetone	No	RIL.
Pyrogallol	No	FSN.
Pyromellitic dianhydride	No	ACH.
2-Pyrrolidinone (2-Pyrrolidone)	No	GAF.
Pyrvinium pamoate	No	(2).
Quinoline:		
Quinoline-2,3-dicarboxylic acid	No	NES.
Quinoline, other grades	No	ATL.
8-Quinolinol	No	SOM.
Resorcinol, dimethyl ether	No	BAS.
Resorcinol, tech.	No	KPT.
α-Resorcylic acid, lead salt	No	KPT.
Salicylaldehyde	No	RDA, WES.
Salicylaldehyde oxime	No	EK.
Salicylanilide	No	PCW.
Salicylic acid, tech	Yes	DOW, HIL, KLM, MON.
Sodium p-sulfophenylmethallyl ether	No	SAL.
Sodium trichlorobenzenesulfate	No	UPF.
Spiro[3H-1,2-benzoxathiole-3,9'-[9H]-xanthene] -3',6'-diol-1,1-dioxide	No	(2).
Styrene (Vinylbenzene)	Yes	AMO, ATR, CSD, DOW, ELP, HCL, MCB, PLC, SC, SHC, SOC.
Sulfaguanidine	No	SAL.
m-Sulfobenzoic acid, monosodium salt	No	EKT.
5-Sulfoisophthalic acid, 1,3-dimethyl ester	No	DUP, PCW.
5-Sulfoisophthalic acid, lithium salt	No	EKT.
5-Sulfoisophthalic acid, sodium salt	No	EKT, PCW.
4,4'-Sulfonyldiphenol (4,4'-Dihydroxydiphenyl sulfone)	No	CRZ.
4-Sulfophthalic acid	No	CWN.
Terephthalic acid	No	AMO, DUP, HCF.
Terephthalic acid, dimethyl ester	Yes	DUP, EKT, HCF.
Terephthaloyl chloride	No	DUP, TLC.
Terphenyl (Phenylbiphenyl) (m-,o-,and p-isomers)	No	MON.
Terpinene-4-ol	No	(2).
1-Tert-butyl-2,5-dimethoxybenzene	No	EKT.

See footnotes at end of table.

Table 10—Continued

Cyclic intermediates for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Cyclic intermediates	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 11)*
Cyclic—Continued		
Tetrabromophthalic anhydride	No	TNA.
Tetrachlorophthalic anhydride	No	MON.
Tetrahydrobenzyl alcohol	No	UCC.
Tetrahydrofuran	Yes	BAS, DUP, QKO.
1,2,3,4-Tetrahydro-2-naphthol	No	GAF.
2,2',3,3'-Tetrahydro-3,3,3',3'-tetramethyl-1,1-' spirobil [1H-indene]-5,5',6,6'-tetrol	No	([2]).
1,2,4,5-Tetramethylbenzene (Durene)	No	KHI.
p-(1,1,3,3-Tetramethylbutyl)phenol	No	GAF.
3,3,4,4-Tetramethylphenol ether	No	TNA.
1,3,6,8-Tetranitro-9H-carbazole	No	SDC.
Thiodiphenol	No	CRZ.
Thionicotinamide	No	RIL.
Thiophenol	No	ICI.
Toluene-2,3-(and 3,4)-diamine (35/65 mixture)	No	OMC.
Toluene-2,4-diamine (4-m-Tolylenediamine)	No	RUC, ([2]).
Toluene-2,4-(and 2,6)-diamine (80/20 mixture)	No	MOB, OMC.
Toluene-3,4-diamine	No	([2]).
p-Toluenesulfonamide	No	UTC.
p-Toluenesulfonic acid	No	TEN, UPF.
p-Toluenesulfonic acid, aniline salt	No	NES.
o-Toluenesulfonyl chloride	No	UPF.
m-Toluic acid	No	WTC.
p-Toluic acid, methyl ester	No	HCF.
o-Toluidine	No	DUP, FST.
m-Toluidine	No	DUP, FST.
p-Toluidine	No	DUP, FST.
2-o-Toluidinoethanol	No	TCH.
p-Toluoyl chloride	No	EKT.
2,2'-(m-Tolylimino)diethanol	No	MIL, TCH.
Tolyltriazole	No	PSG.
1,2,4-Triacetoxybenzene	No	SOM.
2,4,6-Triamino-5-nitrosopyrimidine	No	SK.
2,4,6-Tribromophenol	No	GTL.
3,4',5-Tribromosalicylanilide	No	PCW.
1,2,3(and 1,2,4)-Trichlorobenzene	No	PPG, SCC.
1,2,4-Trichlorobenzene	No	SCC.
1,1,1-Trichloro-2,2-diphenylethane	No	CWN.
3-Trichloromethyl-1,2,4-thiadiazole	No	OMC.
1,2,4-Trichloro-5-nitrobenzene	No	PCW.
2,4,6-Trichlorophenylhydrazine	No	EKT.
Trichlorophenylsilane	No	DCC.
3,5,6-Trichlorosalicylic acid	No	SK.
α,α,α-Trichlorotoluene (Benzotrichloride)	No	HK, VEL.
2,4,6-Trichloro-s-triazine (Cyanuric chloride)	No	DGC.
Tri(dimethylaminomethyl)phenol	No	PEL.
Trimellitic anhydride, acid chloride	No	([2]).
Trimellitic trichloride	No	TLC.
Trimesic acid	No	AMB.
1,2,4-Trimethylbenzene (Pseudocumene)	No	ABB, KHI.
1,3,5-Trimethylbenzene (Mesitylene)	No	KHI.
1,3,3-Trimethyl-δ^2, α-indolineacetaldehyde	No	VPC.
1,3,3-Trimethyl-2-methyleneindoline	No	([2]).
Triphenylmethane	No	EK.
Triphenylphosphine	No	([2]).
Triphenylsulfonium chloride	No	SOM.
α,α',α''-Tris(dimethylamino)mesitol	No	RH.
Tris(2-methyl-1-aziridinyl)phosphine oxide	No	ARS.

See footnotes at end of table.

Table 10—Continued

Cyclic intermediates for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Cyclic intermediates	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 11)*
Cyclic—Continued		
7,7'-Ureylenebis[4-hydroxy-2-naphthalenesulfonic acid] (J-Acid urea)	No	S.
Veratraldehyde (3,4-Dimethoxybenzaldehyde)	No	GIV.
Vinylcyclohexene monoxide	No	UCC.
2-Vinylpyridine	No	RIL.
4-Vinylpyridine	No	RIL.
o-Xylene (90-100% of o-xylene isomer)	Yes	ENJ, KHI, LYP, PLC, PPR, TOC.
m-Xylene (90-100% of m-xylene isomer)	No	AMO, PLC.
p-Xylene (90-100% of p-xylene isomer)	Yes	AMO, ENJ, KHI, LYP, PLC, PPX, SOC, STX, TOC.
2,4-Xylenesulfonic acid	No	UPF.
Xylenesulfonic acid, mixed isomers	No	NES.
2,5-Xylenol	No	PSG.
2,6-Xylenol	No	GE.
3,5-Xylenol	No	PSG.
Xylenol crystals	No	HXL.
Xylenols:		
Xylenol, low boiling point	No	MER.
Xylidines:		
Xylidine, original mixture	No	DUP.
All other cyclic intermediates	Yes	ACY, ATL, BRD, BRS, DUP, EK, EKT, GGI, HCF, HCL, HK, HXL, LC, MRT, NOD, OMC, PAH, PCW, PD, PFZ, PSG, RIL, SAL, SCH, SD, SDC, SDW, SOM, TCH, TNA, TRD, UCC, UPJ, UPJ, UPJ, UPJ, VPC, (2), (2), (2), (2), (2), (2), (2).

1 Chemicals for which seperate statistics are reported in this section are indicated by 'Yes.' Chemicals for which data are accepted in confidence and may not be published are indicated by 'No.'
2 The manufacturer did not consent to his identification with the disignated products.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 11
Cyclic intermediates: Directory of manufacturers, alphabetical by code, 1988

Code	Name of company
ABB	Abbott Laboratories
ACH	Alco Chemical Corp.
ACS	Allied Signal Inc., Engineered Material Sector
ACY	American Cyanamid Co.
AIP	Air Products & Chemicals, Inc.
ALD	Aldrich Chemical Co., Inc.
ALL	Alliance Chemical, Inc.
AMB	American Bio-Synthetics Corp.
AMO	Amoco Corp.
ANG	Angus Chemical Co.
ARK	Armstrong World Industries, Inc.
ARS	Arsynco, Inc.
ART	Aristech Chemical Corp., Chemical Div.
ARZ	Arizona Chemical Co.
ASH	Ashland Oil, Inc., Ashland Petroleum Co.
ATL	Atlantic Industries, Inc.
ATR	Atlantic Richfield Co., Arco Chemical Co.
BAS	BASF Corp.
BCC	Buffalo Color Corp.
BFG	B. F. Goodrich Co., B.F. Goodrich Chemical Group
BKM	Buckman Laboratories, Inc.
BRD	Lonza, Inc.
BRS	Bristol-Myers Co.
BTL	BTL Specialty Resin Corp.
BUC	Synalloy Corp., Blackman Uhler Chemical Div.
CCC	C.N.C. International, Inc.
CED	Cedar Chemical Co.
CGY	Ciba-Geigy Corp.
CHF	Kincaid Enterprises, Inc.
CHT	Chattem, Inc.
CNP	DSM Chemicals Augusta, Inc.
COS	Cosan Chemical Corp.
CPS	CPS Chemical Co., Inc.
CRZ	James River Corp.
CSD	Fina Oil & Chemicals Co., Cosden Chemical Div.
CWN	Upjohn Co., Fine Chemical
CXI	Chemical Exchange Industries, Inc.
DAZ	Diaz Chemical Corp.
DCC	Dow Corning Corp.
DGC	Degussa Corp.
DIX	Dixie Chemical Co., Inc.
DKA	Mobay Synthetics Corp.
DOW	Dow Chemical Co.
DUP	E. I. duPont de Nemours & Co., Inc. Agricultural Products Chemicals and Pigments Dept. Petrochemicals Dept.
EK	Eastman Kodak Co.:
EKT	Tennessee Eastman Co. Div.
ELP	Rexene Products Company
ENJ	Exxon Chemical Americas
FER	Ferro Corp., Ferro Chemical Div.
FMC	FMC Corp.:
FMN	Agricultural Chemical Group
FMT	Fairmount Chemical Co., Inc.
FSN	Nor-Am Chemical Co.
FST	First Chemical Corp.
GAF	GAF Corp., Chemical Group
GE	General ELectric Co.
GGC	Georgia-Gulf Corp.: Houston Div. Plaquemine Div.
GGI	Grow Group, Inc.
GIV	Givaudan Corp
GNW	Greenwood Chemical Co.
GRS	Champlin Petroleum Co.
GTL	Great Lakes Chemical Corp.
GYR	Goodyear Tire & Rubber Co.
HCF	Cape Industries
HCL	Hoechst Celanese Corp.: Bayport Works Fine Chemicals Div. Rhode Island Works Sou-Tex Works
HEX	Hexagon Laboratories, Inc.
HIL	Hilton Davis Co.
HK	Occidental Chemical Corp., Specialty Chemical Div.
HPC	Hercules, Inc.
HXL	Hexcel Corp., Hexcel Chemical Products
ICI	ICI Americas, Inc., Agricultural Chemicals Div. Chemicals Div. Polyurethanes Group.
JSC	Sybron Chemicals, Inc.
KAN	Kanasco, Ltd
KHI	Koch Refining Co.
KLM	Kalama Chemical, Inc.
KPT	Beazer Materials & Services, Inc.
LC	Lord Corp., Chemical Products Group
LEM	Napp Chemicals, Inc.
LIL	Eli Lilly & Co.
LMC	Lomac, Inc.
LYP	Lyondell Petrochemical Co.
MAL	Mallinckrodt, Inc.
MCB	Borg-Warner Corp., Borg-Warner Chemicals
MCK	MacKenzie Chemical Works, Inc.
MER	Merichem Co.
MIL	Milliken & Co., Milliken Chemical Div.
MLC	Melamine Chemicals, Inc.
MNA	Monsanto Agriculture Co.
MOB	Mobay Chemical Corp. Pittsburgh Div.
MON	Monsanto Co.
MRT	Morton-Thiokol, Inc., Morton Chemical Div.
NCC	Niacet, Corp.
NCI	Union Camp Corp., Terpene & Aromatics Div.
NEP	Nepera, Inc.
NES	Ruetgers-Nease Chemical Co.
NOD	Huls America, Inc.
NPC	Northwest Petrochemical Corp.

Table 11—Continued
Cyclic intermediates: Directory of manufacturers, alphabetical by code, 1988

Code	*Name of company*	*Code*	*Name of company*
NSC	National Starch & Chemical Corp.	SOC	Chevron Corp., Chevron Chemical Co.
OMC	Olin Corp.	SOG	Hill Petroleum Company
ORT	Roehr Chemicals, Inc., Div. of Aceto Corp.	SOI	Specialty Organics, Inc.
PAH	Parish Chemical Co.	SOM	Southland Corp.
PAS	Pennwalt Corp.	SRL	G. D. Searle & Co.
PCW	Pfister Chemical, Inc.	STP	Stepan Chemical Co.
PD	Parke-Davis Div. of Warner-Lambert Co.	STX	St. Croix Petrochemical Corp.
PEL	Pelron Corp.	SUN	Sun Company, Inc.
PFZ	Pfizer, Inc., & Pfizer Pharmaceuticals, Inc.	TCC	Sybron Chemical, Inc.
PHC	Phthalchem, Inc.	TCH	Quantum Chemical Corp.
PLC	Phillips 66 Co.	TEN	Tennessee Chemical Co.
PPG	PPG Industries, Inc.	TLC	Twin Lake Chemical, Inc.
PPR	Phillips Puerto Rico Core, Inc.	TLI	Teledyne Industries Inc., Teledyne McCormick Selph
PPX	Phillips Paraxylene, Inc.	TNA	Ethyl Corp.
PSG	PMC Specialities Group Inc.	TOC	Tenneco Oil Co.
QKO	QO Chemicals, Inc.	TRD	Squibb Manufacturing, Inc.
RDA	Rhone-Poulenc, Inc.	TU	Tenn-USS Chemicals Co.
RH	Rohm & Haas Co.	TX	Texaco, Inc., Texaco Chemical Co.
RIL	Reilly Industries, Inc.	UCC	Union Carbide Corp.
RSA	R.S.A. Corp.	UOC	Union Oil Co., of California
RUC	Rubicon, Inc.	UPF	Sloss Industries
S	Sandoz, Inc.	UPJ	Upjohn Co
SAL	Salsbury Laboratories, Inc.	UPM	UOP, Inc.
SC	Sterling Chemicals, Inc.	USM	Crown Metro, Inc.
SCC	Standard Chlorine of Delaware, Inc.	USR	Uniroyal, Inc., Uniroyal Chemical Div.
SCH	The Schering Corp.	UTC	Unitex Chemical Corp.
SCN	Schenectady Chemicals, Inc.	VEL	Velsicol Chemical Corp.
SD	Sterling Drug, Inc., Sterling Pharmaceuticals, Inc.	VNC	Vanderbilt Chemical Corp.
SDC	Sandoz Chemicals Corp.	VPC	Mobay Chemical Corp., Dyes & Pigments Div.
	Sterling Drug, Inc.:	VST	Vista Chemical Co.
SDW	Sterling Organics Div.	WAY	Olin Hunt Specialty Products, Inc.
SHC	Shell Oil Co., Shell Chemical Co.	WES	Wesley Industries
SK	SmithKline Chemicals	WTC	Witco Chemical Corp.
		WYK	Wyckoff Chemical Co., Inc.

Note.—Complete names, telephone numbers, and addresses of the above reporting companies are listed in app. A.
Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission

Section 4

Dyes

Synthetic dyes are derived in whole or in part from cyclic intermediates. Approximately two-thirds of the dyes consumed in the United States are used by the textile industry to dye natural and synthetic fibers or fabrics; about one-sixth is used for coloring paper; and the rest is used chiefly in the production of organic pigments and in dyeing leather and plastics. Of the several thousand different synthetic dyes that are known, more than one thousand are manufactured by domestic producers, collectively. The large number of dyes results from the many different types of materials to which dyes are applied, the different conditions of service for which dyes are required, and the cost that a particular use can bear. Commercial dyes are formulated products which are sold in a variety of physical forms (e.g.) granular, powders, liquids, and pastes) containing concentrations of colorant ranging from 6 percent (approximately) to 100 percent. In the statistical tables, production and sales quantities are expressed in terms of a standard strength of product (based on dyeing performance) and not in terms of the amount of actual colorant.

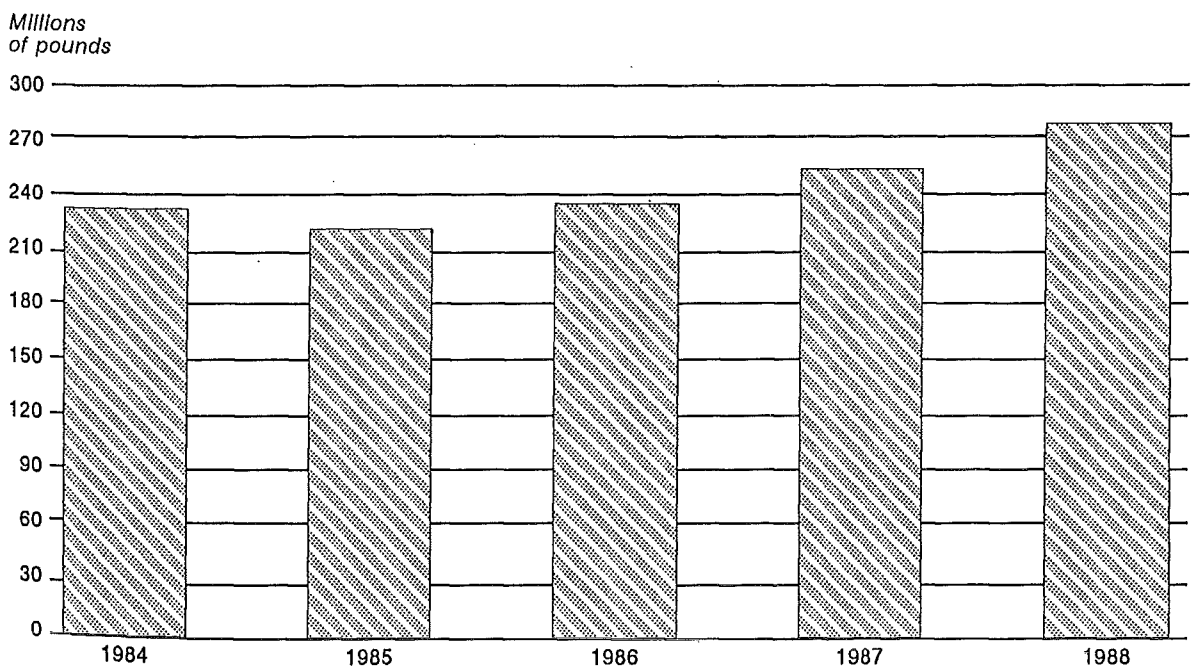
Total domestic production of dyes in 1988 amounted to 280 million pounds, or 10 percent more than the 255 million pounds produced in 1987 (table 12). Sales of dyes in 1988 amounted to 251 million pounds, valued at $766 million, compared with 230 million pounds, valued at $677 million, in 1987. In terms of quantity, sales of dyes in 1988 was 9 percent higher, and in terms of value 13 percent higher. The average unit value of sales of all dyes in 1988 was $3.05 per pound, compared with $2.95 per pound in 1987.

Production of three classes of dyes decreased in 1986, while the remaining seven major classes increased their production. Fiber-reactive dyes and flourescent brightening agents registered significant increases in 1988 while mordant dyes registered a significant decline. Changes in U.S. production of synthetic dyes followed overall changes in U.S. economic activity during 1984–88 (see figure 5).

Table 13 lists the products reported in this section and indicates the manufacturer(s) of each by code. These codes are identified by company name in table 14.

Stephen Wanser
202–252–1363

Figure 5
Dyes: U.S. production, 1984–88



Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 12
Dyes: U.S. production and sales, 1988

Dyes	Production	Sales Quantity	Sales Value	Average Unit value[1]
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Grand total	280,387	250,838	766,148	$3.05
Acid dyes				
Total	17,779	15,372	75,338	4.90
Acid yellow dyes, total	2,962	2,395	9,380	3.92
Acid Yellow 17	92	84	634	7.56
Acid Yellow 23	104	102	490	4.81
All other acid yellow dyes	2,766	2,209	8,256	3.74
Acid orange dyes, total	4,689	3,217	8,243	2.56
Acid Orange 8	108	109	319	2.93
All other acid oranges dyes	4,581	3,108	7,924	2.55
Acid red dyes, total	2,487	2,827	17,883	6.33
Acid Red 1	213	215	707	3.28
Acid Red 137	37	42	361	8.51
Acid Red 182	607	411	2,471	6.01
All other acid red dyes	1,630	2,159	14,344	6.65
Acid violet dyes	89	74	704	9.51
Acid blue dyes total	4,893	4,338	26,986	6.22
Acid Blue 324	1,896	1,672	10,058	6.01
All other acid blue dyes	2,997	2,666	16,928	6.35
Acid green dyes	182	167	1,486	8.90
Acid brown dyes	759	692	3,269	4.72
Acid black dyes	1,718	1,662	7,387	4.45
Basic dyes (classical and modified)				
Total	13,846	12,591	72,575	5.76
Basic yellow dyes, total	3,899	3,526	14,054	3.99
Basic Yellow 11	148	170	794	4.66
Basic yellow dyes, all other, modified	3,751	3,356	13,260	3.95
Basic orange dyes, total	732	699	3,006	4.30
Basic Orange 2	291	303	844	2.79
All other basic orange dyes	441	396	2,162	5.45
Basic red dyes, total	1,748	1,690	8,937	5.25
Basic Red 15	416	406	1,439	3.55
All other basic red dyes	1,332	1,284	7,498	5.84
Basic violet dyes, total	3,597	3,237	13,601	4.20
Basic Violet 1	1,403	1,228	3,389	2.76
Basic Violet 3	1,436	1,289	4,991	3.87
Basic Violet 16	255	303	1,695	5.60
All other basic violet dyes	503	417	3,526	8.46

See footnotes at end of table.

Table 12—Continued
Dyes: U.S. production and sales, 1988

Dyes	Production	Sales Quantity	Sales Value	Average Unit value[1]
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Basic dyes (classical and modified)—Continued				
Basic blue dyes	2,062	1,970	14,026	$7.12
All other basic dyes	1,808	1,469	18,951	12.91
Direct dyes				
Total	41,616	40,053	98,134	2.45
Direct yellow dyes, total	16,616	16,168	34,034	2.11
Direct Yellow 127	1,155	934	2,243	2.40
All other direct yellow dyes	15,461	15,234	31,791	2.09
Direct orange dyes	1,894	1,342	3,201	2.39
Direct red dyes, total	7,738	5,950	20,622	3.47
Direct Red 83	39	40	205	5.10
Direct Red 254	2,279	1,190	3,003	2.52
All other direct red dyes	5,420	4,720	17,414	3.69
Direct violet and green dyes	218	148	740	5.00
Direct blue dyes, total	7,733	9,067	22,766	2.51
Direct Blue 80	301	335	1,635	4.88
Direct Blue 86	673	650	1,776	2.73
Direct Blue 98	247	235	938	4.00
All other direct blue dyes	6,512	7,847	18,417	2.35
Direct brown dyes	248	254	584	2.30
Direct black dyes	7,169	7,124	16,187	2.27
Disperse dyes				
Total	30,064	21,874	99,689	4.56
Disperse yellow dyes	2,252	1,827	8,133	4.45
Disperse orange dyes, total	5,601	3,363	9,938	2.96
Disperse Orange 25 and 25:1	275	251	720	2.86
All other disperse orange dyes	5,326	3,112	9,218	2.96
Disperse red dyes, total	5,477	4,232	25,877	6.11
Disperse Red 73	582	434	1,585	3.66
Disperse Red 177	313	296	1,512	5.10
All other disperse red dyes	4,582	3,502	22,780	6.50
Disperse violet dyes	356	249	2,206	8.86
Disperse blue dyes	13,637	10,245	43,960	4.29
Disperse black, brown and green dyes, total	2,741	1,958	9,575	4.89
Disperse Brown 1	699	705	2,375	3.37
All other disperse black, brown, and green dyes	2,042	1,253	7,200	5.75

See footnotes at end of table.

Table 12—Continued
Dyes: U.S. production and sales, 1988

Dyes	Production	Sales Quantity	Sales Value	Average Unit value[1]
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Fiber-reactive dyes				
Total	19,235	18,669	107,589	$5.76
Fluorescent brightening agents				
Total	77,381	69,813	102,062	1.46
Food, drug, and cosmetic colors				
Total	6,973	6,625	51,017	7.70
Food, drug and cosmetic dyes, total	6,606	6,307	46,239	7.33
FD&C Red No. 3	303	326	4,649	14.26
FD&C Yellow No. 6	1,637	1,499	6,804	4.54
All other food, drug, and cosmetic, dyes	4,666	4,482	34,786	7.76
Drug and cosmetic dyes, total[2]	367	318	4,778	14.65
Mordant dyes				
Total	56	39	178	4.56
Solvent dyes				
Total	12,448	8,921	43,012	4.82
Solvent yellow dyes	1,583	1,423	9,491	6.67
Solvent orange dyes	504	476	3,313	6.96
Solvent red dyes	3,384	3,356	14,818	4.42
Solvent blue dyes	3,534	1,080	7,400	6.85
All other solvent dye	3,443	2,586	7,990	3.09
Vat dyes				
Total	30,966	30,355	58,648	1.93
Vat orange dyes	100	108	708	6.56
Vat red dyes	280	248	2,115	8.53
Vat violet dyes	232	183	1,361	7.44
Vat blue dyes	29,370	28,941	50,211	1.73
Vat green dyes	403	268	1,100	4.10
Vat brown dyes	312	324	1,852	5.72
Vat black dyes	269	283	1,301	4.60
All other dyes				
Total[3]	30,023	26,526	57,906	2.18

[1] Calculated from unrounded figures.
[2] The data include external drug and cosmetic dyes.
[3] The data include azoic compositions, azoic coupling components, azoic diazo components (bases and salts), sulfur dyes, and miscellaneous dyes. Statistics for those groups of dyes may not be published separately because publication would disclose information received in confidence.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 13

Dyes for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Dyes	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 14)*
Acid dyes	Yes	
Acid yellow dyes:	Yes	
Acid Yellow 3	No	ACY.
Acid Yellow 17	Yes	ATL, CK, HIL.
Acid Yellow 23	Yes	BAS, CK, HIL, LVR, WJ.
Acid Yellow 34	No	ATL.
Acid Yellow 36	No	ATL.
Acid Yellow 49	No	ATL, CK.
Acid Yellow 59	No	BAS.
Acid Yellow 65	No	ATL.
Acid Yellow 73	No	HIL.
Acid Yellow 87	No	CK.
Acid Yellow 99	No	CK.
Acid Yellow 127	No	CK.
Acid Yellow 129	No	CK.
Acid Yellow 135	No	ICI.
Acid Yellow 151	No	CGY, CK.
Acid Yellow 159	No	CK.
Acid Yellow 174	No	FAB.
Acid Yellow 198	No	CK.
Acid Yellow 200	No	CK.
Acid Yellow 219	No	CGY, CK.
Acid Yellow 226	No	BAS.
Acid Yellow 239	No	DGO.
All other acid yellow dyes	No	CK.
Acid orange dyes:	Yes	
Acid Orange 7	No	BAS, CK.
Acid Orange 8	Yes	ATL, BAS, CK.
Acid Orange 10	No	ATL, CK.
Acid Orange 24	No	CK, FAB, S.
Acid Orange 60	No	CGY, CK.
Acid Orange 64	No	ATL.
Acid Orange 89	No	BAS.
Acid Orange 116	No	CGY, CK.
Acid Orange 128	No	CK.
Acid Orange 152	No	CK.
Acid Orange 156	No	CGY, CK, S.
Acid Orange 161	No	ATL.
Acid red dyes:	Yes	
Acid Red 1	Yes	ATL, BAS, CGY, CK.
Acid Red 4	No	ATL.
Acid Red 14	No	ATL, BAS.
Acid Red 18	No	ATL.
Acid Red 57	No	CK.
Acid Red 73	No	ATL, CK, PSC, S.
Acid Red 85	No	FAB.
Acid Red 87	No	HIL.
Acid Red 88	No	ATL.
Acid Red 97	No	ATL.
Acid Red 114	No	CGY.
Acid Red 119	No	CK.
Acid Red 137	Yes	ATL, BAS, CK, LVR.
Acid Red 151	No	ATL, CK.
Acid Red 174	No	CGY.
Acid Red 182	Yes	CGY, CK, VPC.
Acid Red 186	No	CGY.
Acid Red 226	No	BAS.
Acid Red 266	No	CK.
Acid Red 296	No	BAS.
Acid Red 299	No	CK.

See footnotes at end of table.

Table 13—Continued

Dyes for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Dyes	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 14)*
Acid dyes—Continued		
Acid red dyes—Continued		
Acid Red 337	No	ATL, CK.
Acid Red 364	No	CK.
Acid Red 384	No	CK.
Acid Red 388	No	CK.
Acid Red 396	No	ICI.
Acid Red 410	No	ATL.
All other acid red dyes	No	ATL, BAS, CGY, CK.
Acid violet dyes:	Yes	
Acid Violet 3	No	ATL, FAB.
Acid Violet 7	No	ATL, FAB.
Acid Violet 12	No	ATL, FAB.
Acid Violet 17	No	HIL.
Acid Violet 49	No	HIL.
Acid blue dyes:	Yes	
Acid Blue 9	No	BAS, HIL, LVR, WJ.
Acid Blue 15	No	BAS.
Acid Blue 25	No	VPC.
Acid Blue 40	No	ATL, CK, VPC.
Acid Blue 41	No	ATL, CK.
Acid Blue 67	No	BAS.
Acid Blue 92	No	FAB.
Acid Blue 113	No	CK.
Acid Blue 118	No	ATL.
Acid Blue 145	No	ATL, CK.
Acid Blue 231	No	CK.
Acid Blue 283	No	S.
Acid Blue 298	No	CK.
Acid Blue 321	No	ATL.
Acid Blue 324	Yes	CK, S, VPC.
Acid Blue 330	No	ATL.
All other acid blue dyes	No	CK.
Acid green dyes:	Yes	
Acid Green 1	No	LVR.
Acid Green 5	No	WJ.
Acid Green 9	No	LVR.
Acid Green 20	No	ATL.
Acid Green 25	No	ATL, CK.
All other acid green dyes	No	FAB.
Acid brown dyes:	Yes	
Acid Brown 14	No	CK, LVR, S.
Acid Brown 19	No	CK.
Acid Brown 50	No	BAS.
Acid Brown 96	No	FAB.
Acid Brown 97	No	BAS, FAB.
Acid Brown 98	No	FAB.
Acid Brown 147	No	CK.
Acid Brown 159	No	BAS, FAB.
Acid Brown 160	No	BAS.
Acid Brown 161	No	BAS.
Acid Brown 165	No	BAS.
Acid Brown 188	No	CK.
Acid Brown 189	No	CK.
Acid Brown 227	No	BAS.
Acid Brown 239	No	CK.
Acid Brown 264	No	BAS.
Acid Brown 439	No	CK.
All other acid brown dyes	No	BAS, FAB.

See footnotes at end of table.

Table 13—Continued

Dyes for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Dyes	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 14)*
Acid dyes—Continued		
Acid black dyes:	Yes	
Acid Black 1	No	CK.
Acid Black 2	No	ATL, LVR.
Acid Black 52	No	ATL, CK, S.
Acid Black 60	No	CK.
Acid Black 63	No	BAS.
Acid Black 107	No	CK.
Acid Black 172	No	ICI.
Acid Black 194	No	BAS.
Acid Black 210	No	BAS.
All other acid black dyes	No	BAS, CK.
Azoic dyes and components:	No	
Azoic compositions:	No	
Azoic yellow compositions:	No	
Azoic Yellow 1	No	BUC.
Azoic orange compositions:	No	
Azoic Orange 3	No	BUC.
Azoic red compositions:	No	
Azoic Red 1	No	BUC.
Azoic Red 2	No	BUC.
Azoic Red 6	No	BUC.
All other azoic red compositions	No	ALL, BUC.
Azoic violet compositions:	No	
Azoic Violet 1	No	BUC.
All other azoic violet compositions	No	BUC.
Azoic blue compositions:	No	
Azoic Blue 3	No	BUC.
All other azoic blue compositions	No	BUC.
Azoic brown compositions:	No	
Azoic Brown 9	No	BUC.
All other azoic brown compositions	No	BUC.
Azoic black compositions:	No	
Azoic Black 4	No	BUC.
All other azoic black compositions	No	BUC.
Azoic diazo components, bases:	No	
Azoic Diazo Component 5, base	No	ALL.
Azoic Diazo Component 13, base	No	ALL.
Azoic Diazo Component 32, base	No	ALL.
All other azoic diazo components, base	No	ALL.
Azoic diazo components, salts:	No	
Azoic Diazo Component 1, salt	No	ALL, BUC.
Azoic Diazo Component 3, salt	No	ALL, BUC.
Azoic Diazo Component 5, salt	No	ALL.
Azoic Diazo Component 8, salt	No	ALL, BUC.
Azoic Diazo Component 9, salt	No	ALL, BUC.
Azoic Diazo Component 10, salt	No	ALL, BUC.
Azoic Diazo Component 11, salt	No	ALL.
Azoic Diazo Component 12, salt	No	ALL, BUC.
Azoic Diazo Component 13, salt	No	ALL, BUC.
Azoic Diazo Component 14, salt	No	ALL.
Azoic Diazo Component 20, salt	No	ATL.
Azoic Diazo Component 32, salt	No	ATL.
Azoic Diazo Component 34, salt	No	ALL.
Azoic Diazo Component 35, salt	No	ALL.
Azoic Diazo Component 41, salt	No	ALL.
Azoic Diazo Component 42, salt	No	ALL.
Azoic Diazo Component 44, salt	No	ALL.

See footnotes at end of table.

Table 13—Continued

Dyes for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Dyes	Separate statistics[1]	Manufacturers' identification codes (according to list in table 14)
Azoic dyes and components—Continued		
Azoic diazo components, salts—Continued		
Azoic Diazo Component 48, salt	No	ATL.
Azoic Diazo Component 49, salt	No	ALL.
All other azoic diazo components, salt	No	ALL.
Azoic coupling components:	No	
Azoic Coupling Component 2	No	ALL.
Azoic Coupling Component 3	No	PCW.
Azoic Coupling Component 4	No	ALL.
Azoic Coupling Component 7	No	PCW.
Azoic Coupling Component 12	No	ALL, PCW.
Azoic Coupling Component 14	No	ALL.
Azoic Coupling Component 17	No	ALL.
Azoic Coupling Component 18	No	ALL.
Azoic Coupling Component 20	No	PCW.
Azoic Coupling Component 21	No	PCW.
Azoic Coupling Component 29	No	PCW.
Azoic Coupling Component 34	No	ALL.
Azoic Coupling Component 43	No	ALL.
Basic dyes (classical and modified)	Yes	
Basic yellow dyes:	Yes	
Basic Yellow 2	No	ACY.
Basic Yellow 11	Yes	ATL, CK, VPC.
Basic Yellow 13	No	ATL.
Basic Yellow 15	No	CK.
Basic Yellow 24	No	BAS.
Basic Yellow 25	No	BAS.
Basic Yellow 28	No	BAS, VPC.
Basic Yellow 29	No	BAS.
Basic Yellow 37	No	ACY.
Basic Yellow 53	No	CK.
Basic Yellow 58	No	VPC.
Basic Yellow 65	No	BAS.
Basic Yellow 79	No	CK.
Basic Yellow 83	No	CK.
Basic Yellow 94	No	S.
Basic Yellow 96	No	BAS.
Basic Yellow 98	No	BAS.
Basic Yellow 102	No	BAS.
All other basic yellow dyes	No	ACY, ([2]).
All other, modified basic yellow dyes	No	CK.
Basic orange dyes:	Yes	
Basic Orange 1	No	ATL, BAS, CK, PSC.
Basic Orange 2	Yes	ACY, ATL, CK, PSC.
Basic Orange 21	No	ATL, VPC.
Basic Orange 26	No	CK.
All other basic orange dyes	No	([2]).
Basic red dyes:	Yes	
Basic Red 12	Yes	ACY, ATL, VPC.
Basic Red 14	No	BAS, CK.
Basic Red 15	Yes	ATL, BAS, CK.
Basic Red 17	No	CK.
Basic Red 22	No	CK.
Basic Red 29	No	BAS.
Basic Red 46	No	CK.
Basic Red 49	No	BAS.
Basic Red 54	No	BAS.
Basic Red 73	No	CK.

See footnotes at end of table.

Table 13—Continued

Dyes for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Dyes	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 14)*
Basic dyes (classical and modified)—Continued		
Basic red dyes—Continued		
Basic Red 104	No	CK.
Basic Red 111	No	S.
All other basic red dyes	No	([2]).
Basic violet dyes:	No	
Basic Violet 1	Yes	ACY, BAS, DSC.
Basic Violet 3	Yes	ACY, BAS, CK, DSC.
Basic Violet 4	No	ACY, DSC.
Basic Violet 10	No	ACY, BAS.
Basic Violet 16	Yes	ATL, CK, VPC.
Basic Violet 35	No	BAS.
All other basic violet dyes	No	BAS, ([2]).
Basic blue dyes:	Yes	
Basic Blue 1	No	ACY.
Basic Blue 3	No	BAS, CK.
Basic Blue 7	No	DSC.
Basic Blue 21	No	CK.
Basic Blue 41	No	BAS.
Basic Blue 54	No	BAS.
Basic Blue 60	No	BAS.
Basic Blue 77	No	CK.
Basic Blue 94 and 94:1	No	CK.
Basic Blue 140	No	VPC.
Basic Blue 152	No	BAS.
All other basic blue dyes	No	BAS, ([2]).
All other, modified basic blue dyes	No	CK, VPC.
Basic green dyes:	No	
Basic Green 4	No	ACY, BAS.
All other basic green dyes	No	([2]).
Basic brown dyes:	No	
Basic Brown 1	No	PSC.
Basic Brown 4	No	ACY, BAS, FAB, PSC.
All other basic brown dyes	No	BAS.
Basic black dyes:	No	
All other basic black dyes	No	ACY, BAS, ([2]).
All other, modified basic black dyes	No	BAS, CK, VPC.
Direct dyes	Yes	
Direct yellow dyes:	Yes	
Direct Yellow 4	No	ATL, BAS, CGY, CK, LVR, VPC.
Direct Yellow 5	No	BAS.
Direct Yellow 6	No	CGY, VPC.
Direct Yellow 11	No	BAS, VPC.
Direct Yellow 28	No	ATL, CK.
Direct Yellow 34	No	CK.
Direct Yellow 44	No	CK.
Direct Yellow 51	No	S.
Direct Yellow 105	No	CGY, CK.
Direct Yellow 106	No	CK.
Direct Yellow 107	No	CK.
Direct Yellow 118	No	CK.
Direct Yellow 119	No	VPC.
Direct Yellow 127	Yes	BAS, CGY, CK, VPC.
Direct Yellow 131	No	VPC.
Direct Yellow 132	No	S.
Direct Yellow 133	No	S.
Direct Yellow 137	No	VPC.
Direct Yellow 147	No	BAS, VPC.

See footnotes at end of table.

Table 13—Continued

Dyes for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Dyes	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 14)*
Direct dyes—Continued		
Direct yellow dyes—Continued		
Direct Yellow 148	No	S.
Direct Yellow 154	No	VPC.
All other direct yellow dyes	No	ATL, BAS, CK, VPC.
Direct orange dyes:	Yes	
Direct Orange 6	No	ATL.
Direct Orange 8	No	FAB.
Direct Orange 15	No	BAS, CGY, VPC.
Direct Orange 26	No	CK.
Direct Orange 34	No	ATL.
Direct Orange 39	No	CK, FAB, VPC.
Direct Orange 72	No	CK.
Direct Orange 80	No	ATL.
Direct Orange 102	No	ATL, BAS, CGY, VPC.
Direct Orange 118	No	S.
All other direct orange dyes	No	BAS.
Direct red dyes:	Yes	
Direct Red 2	No	ATL.
Direct Red 4	No	CK.
Direct Red 9	No	CK.
Direct Red 16	No	ATL.
Direct Red 23	No	ATL.
Direct Red 24	No	ATL.
Direct Red 26	No	ATL.
Direct Red 72	No	CGY, CK.
Direct Red 73	No	ATL.
Direct Red 80	No	ATL, CK, VPC.
Direct Red 81	No	ATL, CK, FAB, LVR, VPC.
Direct Red 83	Yes	ATL, CK, FAB.
Direct Red 236	No	BAS, CGY, VPC.
Direct Red 238	No	VPC.
Direct Red 239	No	BAS, CK, S.
Direct Red 254	Yes	BAS, CGY, VPC.
All other direct red dyes	No	ACY, ATL, BAS, CK, VPC.
Direct violet dyes:	No	
Direct Violet 9	No	ATL.
Direct Violet 66	No	ATL.
Direct Violet 99	No	VPC.
Direct blue dyes:	Yes	
Direct Blue 15	No	VPC.
Direct Blue 22	No	CGY.
Direct Blue 25	No	ATL.
Direct Blue 75	No	CK, S.
Direct Blue 76	No	CK.
Direct Blue 80	Yes	ATL, CGY, CK, FAB.
Direct Blue 86	Yes	CGY, CK, S, VPC.
Direct Blue 98	Yes	ATL, CK, FAB.
Direct Blue 100	No	FAB.
Direct Blue 108	No	ATL.
Direct Blue 160	No	CK.
Direct Blue 189	No	CK.
Direct Blue 191	No	CK.
Direct Blue 199	No	BAS, VPC.
Direct Blue 218	No	ATL, CK, FAB, VPC.
Direct Blue 269	No	VPC.
Direct Blue 279	No	VPC.
Direct Blue 281	No	CGY.
Direct Blue 283	No	ATL.
Direct Blue 286	No	ATL.
All other direct blue dyes	No	ATL, BAS, CK, FAB, VPC.

See footnotes at end of table.

Table 13—Continued

Dyes for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Dyes	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 14)*
Direct dyes—Continued		
Direct green dyes:	No	
Direct Green 92	No	ATL.
All other direct green dyes	No	FAB.
Direct brown dyes:	No	
Direct Brown 44	No	FAB.
Direct Brown 231	No	ATL.
Direct Brown 232	No	ATL.
Direct Brown 238	No	ATL.
All other direct brown dyes	No	ATL, BAS, CK, FAB, VPC.
Direct black dyes:	No	
Direct Black 22	No	ATL, CK.
Direct Black 80	No	ATL, CK.
Direct black 163	No	S.
Direct Black 165	No	ATL.
Direct Black 170	No	ATL.
All other direct black dyes	No	ATL, BAS, CK, FAB, VPC.
Disperse dyes	Yes	
Disperse yellow dyes:	Yes	
Disperse Yellow 3	No	CK.
Disperse Yellow 23	No	ATL, CK.
Disperse Yellow 34	No	EKT.
Disperse Yellow 42	No	CGY, S.
Disperse Yellow 54	No	BAS.
Disperse Yellow 64	No	BAS, HCL.
Disperse Yellow 77	No	VPC.
Disperse Yellow 86	No	EKT.
Disperse Yellow 88	No	EKT.
Disperse Yellow 108	No	EKT.
Disperse Yellow 114	No	HCL.
Disperse Yellow 126	No	ICI.
Disperse Yellow 198	No	BAS.
Disperse Yellow 219	No	S.
Disperse Yellow 238	No	CK.
Disperse Yellow 239	No	CK.
All other disperse yellow dyes	No	BAS, ICI, VPC.
Disperse orange dyes:	Yes	
Disperse Orange 3	No	ATL, CK.
Disperse Orange 17	No	ATL.
Disperse Orange 25 and 25:1	Yes	ATL, CGY, CK, ICI, VPC.
Disperse Orange 29	No	CK.
Disperse Orange 30	No	ATL, CGY, CK, S.
Disperse Orange 33	No	BUC.
Disperse Orange 37	No	ATL, CK, EKT.
Disperse Orange 41	No	CGY, S.
Disperse Orange 44 and 44:1	No	ATL, CGY, CK, S, SDC.
Disperse Orange 73	No	ATL, BAS.
Disperse Orange 89	No	CK.
Disperse Orange 94	No	S.
Disperse Orange 136	No	EKT.
Disperse Orange 138	No	EKT.
Disperse Orange 145	No	EKT.
All other disperse orange dyes	No	CK.
Disperse red dyes:	Yes	
Disperse Red 1	No	ATL, CK.
Disperse Red 5	No	ATL, CK.
Disperse Red 13	No	ATL.
Disperse Red 17	No	ATL, CK.

See footnotes at end of table.

Table 13—Continued

Dyes for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Dyes	Separate statistics[1]	Manufacturers' identification codes (according to list in table 14)
Disperse dyes—Continued		
Disperse red dyes—Continued		
Disperse Red 30	No	EKT.
Disperse Red 50	No	CK.
Disperse Red 55	No	BAS.
Disperse Red 60	No	BAS.
Disperse Red 65	No	CK.
Disperse Red 73	Yes	ATL, CK, ICI, S.
Disperse Red 74	No	S.
Disperse Red 91	No	BAS.
Disperse Red 135	No	CK.
Disperse Red 145	No	CK.
Disperse Red 153	No	CK, S.
Disperse Red 159	No	VPC.
Disperse Red 167 and 167:1	No	ATL, CGY, CK, S.
Disperse Red 177	Yes	CK, ICI, S.
Disperse Red 179	No	BAS, S.
Disperse Red 195	No	S.
Disperse Red 263	No	BAS, S.
Disperse Red 274	No	S.
Disperse Red 278	No	ICI.
Disperse Red 305	No	EKT.
Disperse Red 307	No	EKT.
Disperse Red 309	No	EKT.
Disperse Red 311	No	ICI.
Disperse Red 313	No	S.
Disperse Red 316	No	S.
Disperse Red 325	No	CK.
Disperse Red 333	No	S.
Disperse Red 338	No	EKT.
Disperse Red 339	No	EKT.
Disperse Red 340	No	EKT.
Disperse Red 341	No	EKT.
Disperse Red 345	No	CK.
Disperse Red 358	No	HCL.
All other disperse red dyes	No	CK.
Disperse violet dyes:	Yes	
Disperse Violet 1	No	ATL, CK.
Disperse Violet 17	No	CK.
Disperse Violet 28	No	CK.
Disperse Violet 33	No	ICI, S.
Disperse Violet 36	No	S.
Disperse Violet 48	No	HCL.
Disperse Violet 60	No	S.
Disperse Violet 91	No	CGY.
Disperse blue dyes:	Yes	
Disperse Blue 3	No	CK, EKT, FAB.
Disperse Blue 27	No	EKT.
Disperse Blue 56	No	S.
Disperse Blue 60	No	BAS.
Disperse Blue 62	No	EKT.
Disperse Blue 64	No	EKT.
Disperse Blue 73	No	S.
Disperse Blue 79	No	BAS, BUC, CGY, EKT, HCL, ICI, S.
Disperse Blue 95	No	HCL.
Disperse Blue 102	No	CK, EKT.
Disperse Blue 118	No	EKT.
Disperse Blue 122	No	ICI.
Disperse Blue 148	No	BAS.
Disperse Blue 183	No	ATL.

See footnotes at end of table.

Table 13—Continued

Dyes for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Dyes	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 14)*
Disperse dyes—Continued		
Disperse blue dyes—Continued		
Disperse Blue 200	No	ICI.
Disperse Blue 281	No	S.
Disperse Blue 284	No	ICI.
Disperse Blue 291	No	S.
Disperse Blue 333	No	HCL.
Disperse Blue 337	No	EKT.
Disperse Blue 338	No	EKT.
Disperse Blue 359	No	CK.
Disperse Blue 360	No	CK.
All other disperse blue dyes	No	ATL, BAS, BUC, CK, HCL, ICI.
Disperse green dyes:	No	
Disperse Green 9	No	ICI.
Disperse brown dyes:	No	
Disperse Brown 1	Yes	ATL, BUC, CK, ICI, S.
Disperse Brown 18	No	S.
Disperse Brown 22	No	EKT.
Disperse Brown 26	No	CK.
Disperse Brown 27	No	CK.
Disperse black dyes:	No	
Disperse Black 9	No	ATL, EKT.
Disperse Black 33	No	CGY.
All other disperse black dyes	No	BAS, CK, HCL.
Fiber-reactive dyes	Yes	
Reactive yellow dyes:	No	
Reactive Yellow 7	No	ICI.
Reactive Yellow 15	No	HCL.
Reactive Yellow 17	No	HCL.
Reactive Yellow 18	No	ICI.
Reactive Yellow 22	No	ICI.
Reactive Yellow 37	No	HCL.
Reactive Yellow 42	No	HCL.
Reactive Yellow 86	No	ICI.
Reactive Yellow 125	No	S.
Reactive Yellow 133	No	ICI.
Reactive Yellow 135	No	ICI.
Reactive Yellow 160	No	HCL.
All other reactive yellow dyes	No	HCL, ICI.
Reactive orange dyes:	No	
Reactive Orange 1	No	ICI.
Reactive Orange 4	No	ICI.
Reactive Orange 12	No	ICI.
Reactive Orange 13	No	ICI.
Reactive Orange 14	No	ICI.
Reactive Orange 16	No	ATL, CK, HCL.
Reactive Orange 20	No	CK.
Reactive Orange 78	No	HCL.
Reactive Orange 84	No	ICI.
Reactive Orange 86	No	CK, ICI.
All other reactive orange dyes	No	HCL.
Reactive red dyes:	No	
Reactive Red 2	No	CK, ICI.
Reactive Red 8	No	ICI.
Reactive Red 11	No	ICI.
Reactive Red 21	No	HCL.
Reactive Red 29	No	ICI.
Reactive Red 31	No	ICI.

See footnotes at end of table.

Table 13—Continued

Dyes for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Dyes	Separate statistics[1]	Manufacturers' identification codes (according to list in table 14)
Fiber-reactive dyes—Continued		
Reactive red dyes—Continued		
Reactive Red 33	No	ICI.
Reactive Red 35	No	HCL.
Reactive Red 43	No	CK, ICI.
Reactive Red 49	No	HCL.
Reactive Red 94	No	HCL.
Reactive Red 120	No	BAS, CK, ICI.
Reactive Red 141	No	ICI.
Reactive Red 147	No	S.
Reactive Red 180	No	ATL, HCL.
All other reactive red dyes	No	ATL, CK, HCL, ICI.
Reactive violet dyes:	No	
Reactive Violet 1	No	ICI.
Reactive Violet 5	No	HCL.
All other reactive violet dyes	No	HCL, ICI.
Reactive blue dyes:	No	
Reactive Blue 3	No	ICI.
Reactive Blue 4	No	CK, ICI.
Reactive Blue 5	No	ICI.
Reactive Blue 13	No	ICI.
Reactive Blue 19	No	HCL.
Reactive Blue 21	No	HCL.
Reactive Blue 38	No	HCL.
Reactive Blue 41	No	S.
Reactive Blue 71	No	ICI.
Reactive blue 79	No	S.
Reactive Blue 89	No	HCL, ICI.
Reactive Blue 173	No	ICI.
Reactive Blue 174	No	ICI.
Reactive Blue 199	No	ICI.
Reactive Blue 203	No	HCL.
All other reactive blue dyes	No	HCL, ICI.
Reactive green dyes:	No	
Reactive Green 19	No	ICI.
Reactive brown dyes:	No	
Reactive Brown 1	No	ICI.
Reactive Brown 17	No	ICI.
Reactive Brown 18	No	HCL.
Reactive black dyes:		
Reactive Black 5	No	ATL, CK, HCL.
Reactive Black 9	No	ICI.
All other reactive black dyes	No	HCL.
Fluorescent brighteners	Yes	
Fluorescent Brightener 22	No	CGY.
Fluorescent Brightener 28	No	CGY, VPC.
Fluorescent Brightener 46	No	CGY.
Fluorescent Brightener 49	No	S.
Fluorescent Brightener 52	No	S.
Fluorescent Brightener 61	No	ACY.
Fluorescent Brightener 71	No	CGY.
Fluorescent Brightener 102	No	CGY.
Fluorescent Brightener 114	No	VPC.
Fluorescent Brightener 128	No	HIL.
Fluorescent Brightener 134	No	CGY.
Fluorescent Brightener 191	No	VPC.
Fluorescent Brightener 205	No	VPC.
Fluorescent Brightener 290	No	S.
All other fluorescent brighteners	No	ACY, CGY, S, VPC, (2).

See footnotes at end of table.

Table 13—Continued

Dyes for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Dyes	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 14)*
Food, drug, and cosmetic colors	Yes	
Food, drug, and cosmetic dyes:	Yes	
Food, Drug, and Cosmetic Blue 1	No	HIL, WJ.
Food, Drug, and Cosmetic Blue 2	No	HIL, WJ.
Food, Drug, and Cosmetic Green 3	Yes	WJ.
Food, Drug, and Cosmetic Red 3	No	HIL, STG, WJ.
Food, Drug, and Cosmetic Red 4	No	CK, WJ.
Food, Drug, and Cosmetic Red 40	No	HIL, STG, WJ.
Food, Drug, and Cosmetic Yellow 5	No	CK, HIL, STG, WJ.
Food, Drug, and Cosmetic Yellow 6	Yes	CK, HIL, STG, WJ.
Drug and cosmetic dyes:	Yes	
Drug and Cosmetic Green 5	No	CK, WJ.
Drug and Cosmetic Green 6	No	WJ.
Drug and Cosmetic Green 8	No	HIL, WJ.
Drug and Cosmetic Orange 4	No	CK, WJ.
Drug and Cosmetic Orange 5	No	SNA.
Drug and Cosmetic Orange 17	No	SNA.
Drug and Cosmetic Red 6	No	HIL, SNA, WJ.
Drug and Cosmetic Red 7	No	HIL, MRX, SNA, WJ.
Drug and Cosmetic Red 9	No	SNA.
Drug and Cosmetic Red 17	No	WJ.
Drug and Cosmetic Red 19	No	SNA.
Drug and Cosmetic Red 21	No	SNA.
Drug and Cosmetic Red 27	No	HIL, MRX, SNA.
Drug and Cosmetic Red 30	No	MRX, SNA, WJ.
Drug and Cosmetic Red 33	No	CK, SNA, WJ.
Drug and Cosmetic Red 34	No	SNA.
Drug and Cosmetic Red 36	No	WJ.
Drug and Cosmetic Violet 2	No	WJ.
Drug and Cosmetic Yellow 7	No	WJ.
Drug and Cosmetic Yellow 10	No	CK, HIL, WJ.
Drug and cosmetic dyes, external:	Yes	
External Drug and Cosmetic Orange 3	No	CK, WJ.
External Drug and Cosmetic Yellow 7	No	WJ.
Mordant dyes	Yes	
Mordant yellow dyes:	No	
Mordant Yellow 1	No	FAB.
Mordant orange dyes:	No	
Mordant Orange 1	No	FAB.
Mordant Orange 6	No	ATL, FAB.
Mordant red dyes:	No	
Mordant Red 7	No	ATL.
Mordant brown dyes:	No	
Mordant Brown 1	No	FAB.
Mordant Brown 18	No	FAB.
Mordant Brown 33	No	FAB.
Mordant Brown 70	No	FAB.
Solvent dyes	Yes	
Solvent yellow dyes:	Yes	
Solvent Yellow 3	No	PSC.
Solvent Yellow 13	No	BAS, FAB.
Solvent Yellow 14	No	ATL, PSC.
Solvent Yellow 16	No	PSC.
Solvent Yellow 18	No	ATL.
Solvent Yellow 33	No	ACY, CIC.
Solvent Yellow 40	No	CK.

See footnotes at end of table.

Table 13—Continued

Dyes for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Dyes	Separate statistics[1]	Manufacturers' identification codes (according to list in table 14)
Solvent dyes—Continued		
Solvent yellow dyes—Continued		
Solvent Yellow 42	No	ATL, CK.
Solvent Yellow 43	No	DGO.
Solvent Yellow 56	No	PSC.
Solvent Yellow 72	No	CIC, PSC.
Solvent Yellow 94	No	HIL.
Solvent Yellow 107	No	MRT.
Solvent Yellow 131	No	DGO.
Solvent Yellow 135	No	DGO.
Solvent Yellow 143	No	MRT.
Solvent Yellow 160	No	DGO.
Solvent Yellow 161	No	MRT.
All other solvent yellow dyes	No	ATL, CIC, FAB, MIL, MRT.
Solvent orange dyes:	Yes	
Solvent Orange 2	No	PSC.
Solvent Orange 3	No	ACY, PSC.
Solvent Orange 7	No	ATL, PSC.
Solvent Orange 20	No	BAS, FAB.
Solvent Orange 23	No	ATL, CK.
Solvent Orange 25	No	ATL, MRT.
Solvent Orange 31	No	PSC.
Solvent Orange 60	No	CIC.
Solvent Orange 77	No	MRT.
Solvent Orange 97	No	MRT.
All other solvent orange dyes	No	MRT.
Solvent red dyes:	Yes	
Solvent Red 1	No	PSC.
Solvent Red 23	No	PSC.
Solvent Red 24	No	ATL, PSC.
Solvent Red 26	No	PSC.
Solvent Red 27	No	PSC.
Solvent Red 42	No	HIL.
Solvent Red 49	No	ACY, BAS.
Solvent Red 68	No	ATL, CK, MRT.
Solvent Red 74	No	ATL.
Solvent Red 111	No	MRT.
Solvent Red 164	No	MRT.
Solvent Red 166	No	MRT.
Solvent Red 168	No	MRT.
Solvent Red 169	No	MRT.
Solvent Red 172	No	MRT.
Solvent Red 175	No	MRT.
Solvent Red 207	No	MRT.
Solvent Red 208	No	MRT.
Solvent Red 222	No	CIC.
All other solvent red dyes	No	ATL, CIC, MIL, PSC.
Solvent violet dyes:	No	
Solvent Violet 8	No	BAS, DSC.
Solvent Violet 9	No	DSC.
Solvent Violet 13	No	CK.
Solvent Violet 14	No	MRT.
Solvent Violet 38	No	MRT.
All other solvent violet dyes	No	CK, MIL.
Solvent blue dyes:	Yes	
Solvent Blue 3	No	PSG.
Solvent Blue 4	No	BAS.
Solvent Blue 5	No	DSC.
Solvent Blue 35	No	MRT.
Solvent Blue 36	No	MRT.
Solvent Blue 38	No	TNI.

See footnotes at end of table.

Table 13—Continued

Dyes for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Dyes	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 14)*
Solvent dyes—Continued		
Solvent blue dyes—Continued		
Solvent Blue 58	No	VPC.
Solvent Blue 59	No	MRT, VPC.
Solvent Blue 60	No	ATL.
Solvent Blue 98	No	MRT.
Solvent Blue 99	No	MRT.
Solvent Blue 100	No	MRT.
Solvent Blue 101	No	MRT.
Solvent Blue 102	No	MRT.
Solvent Blue 128	No	MRT.
Solvent Blue 129	No	MRT.
All other solvent blue dyes	No	BAS, CK, MIL.
Solvent green dyes:	No	
Solvent Green 3	No	ACY, MRT.
Solvent brown dyes:	No	
Solvent Brown 12	No	PSC.
Solvent Brown 20	No	ATL.
Solvent Brown 22	No	PSC.
Solvent Brown 38	No	FAB.
Solvent Brown 52	No	MRT.
Solvent black dyes:	No	
Solvent Black 5	No	LVR.
Solvent Black 7	No	BAS, OCC, PSC.
Solvent Black 13	No	ATL, CK.
Solvent Black 26	No	ATL.
Solvent Black 46	No	MRT.
Solvent Black 47	No	MRT.
Solvent Black 49	No	MRT.
Sulfur dyes	No	
Sulfur yellow dyes:	No	
Leuco Sulfur Yellow 22	No	SDC.
All other sulfur yellow dyes	No	SDC.
Sulfur orange dyes:	No	
All other sulfur orange dyes	No	SDC.
Sulfur red dyes:	No	
Leuco Sulfur Red 14	No	SDC.
Sulfur Red 10	No	SDC.
Sulfur blue dyes:	No	
Leuco Sulfur Blue 7	No	SDC.
Leuco Sulfur Blue 11	No	SDC.
Leuco Sulfur Blue 13	No	S.
Sulfur green dyes:	No	
Leuco Sulfur Green 3	No	SDC.
Leuco Sulfur Green 16	No	SDC.
Leuco Sulfur Green 34	No	SDC.
Leuco Sulfur Green 35	No	SDC.
Leuco Sulfur Green 36	No	SDC.
Sulfur brown dyes:	No	
Leuco Sulfur Brown 1, 1:1	No	SDC.
Leuco Sulfur Brown 3	No	SDC.
Leuco Sulfur Brown 10	No	SDC.
Leuco Sulfur Brown 37	No	SDC.
Leuco Sulfur Brown 52	No	SDC.
Sulfur black dyes:	No	
Leuco Sulfur Black 1	No	BRR, SDC.
Leuco Sulfur Black 2	No	S, SDC.
Leuco Sulfur Black 18	No	SDC.

See footnotes at end of table.

Table 13—Continued

Dyes for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Dyes	Separate statistics[1]	Manufacturers' identification codes (according to list in table 14)
Sulfur dyes—Continued		
Solubilized Sulfur Black 1	No	S.
Solubilized Sulfur Black 2	No	SDC.
Sulfur Black 11, 11:1	No	SDC.
Vat dyes	Yes	
Vat orange dyes:	Yes	
Vat Orange 2, 12%	No	BAS.
Vat Orange 7, 11%	No	HCL.
Vat red dyes:	Yes	
Vat Red 10, 18%	No	BAS.
Vat Red 15, 10%	No	HCL.
All other vat red dyes	No	HCL.
Vat violet dyes:	Yes	
Vat Violet 1, 11%	No	BRR.
Vat Violet 13, 6-1/4%	No	BAS.
Vat blue dyes:	Yes	
Vat Blue 1, 20%	No	BCC, PSC.
Vat Blue 6, 8-1/3%	No	BAS.
Vat Blue 16, 16%	No	BAS.
Vat Blue 19	No	BAS.
Vat Blue 20, 14%	No	BRR.
Vat Blue 29	No	BAS.
Vat Blue 43	No	SDC.
Vat Blue 66	No	BAS.
Vat green dyes:	Yes	
Vat Green 1, 6%	No	BAS.
Vat Green 3, 10%	No	BAS, BRR.
Vat Green 7	No	SDC.
Vat Green 8, 8-1/2%	No	BRR.
All other vat green dyes	No	HCL.
Vat brown dyes:	Yes	
Vat Brown 1, 11%	No	BRR.
Vat Brown 57, 12.8%	No	HCL.
All other vat brown dyes	No	HCL.
Vat black dyes:	Yes	
Vat Black 16	No	BRR.
Vat Black 25, 12-1/2%	No	BAS, BRR, SDC.
Miscellaneous dyes:	No	
All other dyes	No	DAN, MIL, MRT.

[1] Chemicals for which separate statistics are reported in this section are indicated by 'Yes.' Chemicals for which data are accepted in confidence and may not be published are indicated by 'No.'
[2] Reported data are accepted in confidence and may not be published, or no data were reported.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 14
Dyes: Directory of manufacturers, alphabetical by code, 1988

Code	*Name of company*	*Code*	*Name of company*
ACY	American Cyanamid Co.	ICI	ICI Americas, Inc., Chemical Div.
ALL	Alliance Chemical, Inc.	LVR	C. Lever Co., Inc.
ATL	Atlantic Industries, Inc.	MIL	Milliken & Co., Milliken Chemical Div.
BAS	BASF Corp.	MRT	Morton-Thiokol, Inc., Morton Chemical Div.
BCC	Buffalo Color Corp.	MRX	Max Marx Color Corp.
BRR	Burris Chemical Inc., Colors Div.	OCC	Orient Chemical Corp.
BUC	Synalloy Corp., Blackman Uhler Chemical Div.	PCW	Pfister Chemical, Inc.
CGY	Ciba-Geigy Corp.	PSC	Passaic Color & Chemical Co.
CIC	Color Chem International Corp.	PSG	PMC Specialities Group, Inc.
CK	Crompton & Knowles Corp.	S	Sandoz, Inc.: Colors & Chemicals Div.
DAN	Dan River, Inc., Chemical Products Div.	SDC	Sandoz Chemical Corp.
DGO	Day-Glo Color Corp.	SNA	Sun Chemical Corp., Pigments Div.
DSC	Dye Specialties Inc.	STG	McCormick & Co., Inc., McCormick/Strange Flavor Div.
EKT	Eastman Kodak Co., Tennessee Eastman Co. Div.	TNI	Gillette Co., Chemical Div.
FAB	Fabricolor Manufacturing Corp.	VPC	Mobay Chemical Corp., Dyes & Pigments Div.
HCL	Hoechst Celanese Corp.: Rhode Island Works Sou-Tex Works	WJ	Warner-Jenkinson Co.
HIL	Hilton Davis Company		

Note.—Complete names, telephone numbers, and addresses of the above reporting companies are listed in app. A.
Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Section 5

Organic Pigments

Organic pigments are toners and lakes[1] derived in whole or in part from benzenoid chemicals and colors.

Statistics on production and sales of all organic pigments in 1988 are given in table 15. Individual toners and lakes are identified in this report by the names used in the third edition of the Colour Index.

Total production of organic pigments in 1988 was 115.9 million pounds, 23.4 percent more than the 93.9 million pounds produced in 1987. Total sales of organic pigments in 1988 amounted to 86.9 million pounds, valued at $594.7 million, compared with 83.3 million pounds, valued at $586.3 million, in 1987. In terms of quantity, sales of organic pigments in 1988 were 4.3 percent higher than in 1987; in terms of value, sales in 1988 were 1.4 percent higher than in 1987. Changes in U.S. production of pigment has followed overall changes in U.S. economic activity during 1984–88 (see figure 6).

[1] Toners and lakes are essentially the same in their final form; they differ in the method of preparation. A lake is an organic pigment produced by the interaction of a soluble dye, a precipitant, and an absorptive inorganic substrate. A toner is an insoluble dye produced as a powder; some toners are extended by the inclusion of a solid diluent.

Production of toners in 1988 amounted to 115.2 million pounds, 24 percent more than the 93.1 million pounds reported in 1987. Sales in 1988 were 86.3 million pounds, valued at $590.1 million, compared with 82.7 million pounds valued at $582 million, in 1987. In terms of quantity, sales of toners in 1988 were 4.4 percent higher than in 1987; in terms of value, sales were 1.5 percent higher in 1988 than in 1987. The individual toners listed in the report which were produced in the largest quantities in 1988 were Pigment Yellow 12, Pigment Blue 15.3, beta form, Pigment Red 49:1 barium toner, Pigment Red 57:1 calcium toner, Pigment Red 53:1, barium toner, and Pigment Yellow 14.

Production of lakes totaled 741,000 pounds in 1988, 4.8 percent lower than the 778,000 pounds reported for 1987. Sales of lakes in 1987 amounted to 530,000 pounds, valued at $4.1 million. In terms of quantity, sales of lakes in 1988 were 7.2 percent lower than in 1987; in terms of value, sales in 1988 were 2 percent lower than in 1987.

Table 16 lists the products reported in this section and indicates the manufacturer(s) of each by code. These codes are identified by company name in table 17.

Stephen Wanser
202-252-1363

Figure 6
Organic pigments: U.S. production, 1984-88

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 15
Organic pigments: U.S. production and sales, 1988

Organic pigments	Production	Sales Quantity	Sales Value[1]	Average Unit value[2]
	1,000 pounds dry basis[3]	1,000 pounds dry basis[3]	1,000 dollars	Per pound
Grand total	115,896	86,875	594,657	$6.84
Toners				
Total	115,155	86,345	590,524	7.04
Yellow toners, total	27,701	23,305	128,939	5.53
Acetoacetarylide yellows:				
Pigment Yellow 3, C.I. 11 710	53	72	439	6.09
Pigment Yellow 65, C.I. 11 740	187	180	1,531	8.49
Pigment Yellow 73, C.I. 11 738	325	319	1,728	5.41
Pigment Yellow 74, C.I. 11 741	699	664	4,965	7.47
Acetoacetarylide yellows, all other	1,970	784	4,630	5.91
Diarylide yellows:				
Pigment Yellow 12, C.I. 21 090	16,680	13,869	71,989	5.19
Pigment Yellow 13, C.I. 21 100	797	693	4,230	6.10
Pigment Yellow 14, C.I. 21 095	5,189	5,002	23,235	4.65
Pigment Yellow 17, C.I. 21 105	617	565	3,813	6.75
Pigment Yellow 83, C.I. 21 108	1,029	1,006	10,223	10.16
All other yellow toners	155	151	2,156	14.28
Orange toners, total	2,518	2,397	16,159	6.74
Pigment Orange 5, C.I. 21 075	752	735	3,718	5.06
Pigment Orange 13, C.I. 21 110	138	142	1,380	9.70
Pigment Orange 16, C.I. 21 160	674	588	4,441	7.56
Pigment Orange 34	41	42	387	9.12
Pigment Orange 46, C.I. 15 602	858	847	4,568	5.39
All other orange toners	55	43	1,665	38.47
Red toners, total	50,763	29,516	218,508	7.40
Naphthol reds, total	1,705	1,740	20,766	11.93
Pigment Red 5, C.I. 12 120	27	46	529	11.45
Pigment Red 17, C.I. 12 390	37	18	176	9.99
Pigment Red 22, C.I. 12 315	222	215	1,804	8.38
Pigment Red 23, C.I. 12 355	137	174	1,964	11.30
All other naphthol reds	1,282	1,287	16,293	12.66
Pigment Red 3, C.I. 12 120	799	877	5,395	6.15
Pigment Red 4, C.I. 12 085	93	87	573	6.60
Pigment Red 38, C.I. 12 120	286	291	2,873	9.39
Pigment Red 48:1, barium toner, C.I. 15 865	2,078	2,023	11,909	5.89
Pigment Red 48:2, calcium toner, C.I. 15 865	1,683	1,608	8,009	4.98
Pigment Red 49:1, barium toner, C.I. 15 630	4,679	3,616	15,351	4.25
Pigment Red 49:2, calcium toner, C.I. 15 630	873	789	4,137	5.24
Pigment Red 53:1, barium toner, C.I. 15 585	4,459	3,302	15,134	4.58
Pigment Red 57:1, calcium toner, C.I. 15 850	13,257	10,658	55,721	5.23
Pigment Red 81, PMA, C.I. 45 160	406	399	6,639	16.64
All other red toners	20,445	4,126	72,001	17.45
Violet toners, total	2,378	2,466	45,557	18.47
Pigment Violet 23, C.I. 51 319	462	509	15,215	29.89
All other violet toners	1,916	1,957	30,342	15.51
Blue toners, total	29,007	25,908	157,403	6.03
Pigment Blue 1, (PMA), C.I. 42 595	100	106	1,575	14.90
Pigment Blue 15, alpha form, C.I. 74 160	1,059	664	5,688	8.56

See footnotes at end of table.

Table 15—Continued
Organic pigments: U.S. production and sales, 1988

Organic pigments	*Production*	*Sales*		*Average Unit value*[2]
		Quantity	*Value*[1]	
	1,000 pounds dry basis[3]	*1,000 pounds dry basis*[3]	*1,000 dollars*	*Per pound*
Toners—Continued				
Blue toners—Continued				
Pigment Blue 15:1, alpha form, C.I. 74 160	1,516	1,084	11,391	$10.51
Pigment Blue 15:2, alpha form, C.I. 74 160	787	638	6,109	9.58
Pigment Blue 15:3, beta form, C.I. 74 160	15,376	13,367	73,881	5.53
Pigment Blue 15:4, (β form)	1,558	1,128	6,698	5.94
All other blue toners	8,611	8,921	52,061	5.84
Green toners, total	2,562	2,504	22,349	8.93
Pigment Green 7, C.I. 74 260	2,407	2,334	19,658	8.42
Pigment Green 36	88	103	1,324	12.90
All other green toners	67	67	1,367	20.34
Brown and black toners,	226	249	1,609	6.46
Lakes				
Total	741	530	4,133	7.80
Pigment Red 83, C.I. 58 000	42	29	383	13.21
Pigment Violet 5:1, C.I. 58 055	62	62	613	9.82
All other lakes	637	439	3,137	7.14

[1] The value of sales for toners is reported on a dry-full strength basis and the value of sales for lakes is reported on a dry form basis. All sales value data exclude the additional cost of processing or packaging in commercial forms other than the dry full-strength or dry form.
[2] Calculated from unrounded figures.
[3] Quantities for toners are reported as dry full-strength toner content, excluding the weight of any dispersing agent, vehicle, or extender. Quantities for lakes are reported as dry lake content, excluding the weight of any dispersing agent or vehicle.
Note.—The C.I. *(Colour Index)* number shown in this report are the identifying number given in the third edition of the *Colour Index*. The abbreviations PMA and PTA stand for phosphomolybdic and phosphotungstic (including phosphotung-stomolybdic) acids, respectively.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 16

Organic pigments for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Organic pigments	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 17)*
Toners	Yes	
Yellow toners:	Yes	
Acetoacetarylide yellows:	Yes	
Pigment Yellow 1	No	BAS, DUP, GLX, HCL, HSH, KCW, SNA.
Pigment Yellow 2	No	KCW.
Pigment Yellow 3	Yes	HEU, HSH, KCW, SNA, VPC.
Pigment Yellow 42	No	CGY, VPC.
Pigment Yellow 60	No	HSH.
Pigment Yellow 65	Yes	HEU, HSH, SNA, VPC.
Pigment Yellow 73	Yes	HCL, HSH, SNA, VPC.
Pigment Yellow 74	Yes	BAS, HCL, HEU, HIL, HSH, ROM, SNA, VPC.
Pigment Yellow 97	No	HCL.
Pigment Yellow 98	No	HCL.
All other acetoacetarylide yellows	No	KCW.
Diarylide yellows:	Yes	
Pigment Yellow 12	No	AMS, APO, BAS, FAB, GLX, HCL, HIL, HSH, IND, POP, ROM, SNA.
Pigment Yellow 13	No	APO, BAS, FAB, GLX, HCL, IDC, IND, ROM, SNA.
Pigment Yellow 14	No	AMS, BAS, BNS, FAB, GLX, HCL, HSH, IDC, IND, ROM, SNA.
Pigment Yellow 17	No	AMS, APO, BAS, CGY, FAB, GLX, HCL, HSH, IDC, IND, ROM, SNA, VPC.
Pigment Yellow 83	No	BAS, FAB, GLX, HCL, IDC, IND, ROM, SNA.
Pigment Yellow 152	No	HCL.
Yellow pigments, other:	No	
(Basic Yellow 2), fugitive	No	MRX.
Pigment Yellow 110	No	CGY.
Pigment Yellow 139	No	VPC.
All other pigment yellow toners	No	HCL, HSH.
Orange toners:	Yes	
Pigment Orange 1	No	KCW.
Pigment Orange 2	No	UHL.
Pigment Orange 5	Yes	BAS, CGY, HCL, HIL, HSH, SNA.
Pigment Orange 13	Yes	BAS, HSH, IND, SNA, VPC.
Pigment Orange 15	No	BNS.
Pigment Orange 16	Yes	BAS, BNS, CGY, FAB, GLX, HSH, IND, ROM.
Pigment Orange 34	No	HCL, IND, ROM, VPC.
Pigment Orange 43	No	HCL.
Pigment Orange 46	Yes	AMS, BAS, CMC, MGR, SNA, UHL.
All other pigment orange toners	No	CGY, GLX.
Red toners:	Yes	
Naphthol reds:	Yes	
Pigment Red 2	Yes	GLX, HCL, HSH.
Pigment Red 5	No	CGY, FAB, GLX, HSH.
Pigment Red 13	No	KCW.
Pigment Red 14	No	HCL.
Pigment Red 17	Yes	BNS, ROM, SNA, UHL.
Pigment Red 21	No	BNS.
Pigment Red 22	Yes	GLX, HEU, IND, MRX, ROM, SNA.
Pigment Red 23	Yes	DUP, FAB, GLX, HEU, HSH, IND, KCW, ROM, SNA, UHL.
Pigment Red 31	No	GLX, HIL, ROM.
Pigment Red 66	No	CGY.
Pigment Red 112	No	HCL, VPC.
Pigment Red 146	No	HCL.
Pigment Red 147	No	HSH.
Pigment Red 170	No	GLX, HCL.
All other naphthol reds	No	BUC, FAB, GLX, IND, KCW, ROM, SNA.

See footnotes at end of table.

Table 16—Continued

Organic pigments for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Organic pigments	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 17)*
Toners—Continued		
Red toners—Continued		
Red pigments, other:	Yes	
Pigment Red 1, (light)	No	HSH.
Pigment Red 3	Yes	BAS, CGY, HIL, HSH, KCW, MRX, SNA, UHL.
Pigment Red 4	Yes	ALE, CGY, HIL, HSH, KCW, MRX, UHL.
Pigment Red 6	No	AMS.
Pigment Red 38	Yes	HCL, HSH, MGR, SNA, VPC.
Pigment Red 41	No	UHL, VPC.
Pigment Red 48	No	CGY.
Pigment Red 48:1, (barium)	Yes	APO, BAS, CGY, CMC, FAB, HEU, HIL, HSH, MGR, MRX, SNA, UHL.
Pigment Red 48:2, (calcium)	Yes	AMS, APO, BAS, CGY, CMC, FAB, HEU, HIL, HSH, MRX, SNA, UHL, VPC.
Pigment Red 48:3, (strontium)	No	CGY, HSH.
Pigment Red 48:4, (manganese)	No	CGY, HEU, HSH, SNA, VPC.
Pigment Red 49:1, (barium)	Yes	AMS, BAS, BNS, CMC, HIL, IDC, MGR, SNA, UHL.
Pigment Red 49:2, (calcium)	Yes	AMS, CMC, HIL, IDC, MGR, SNA, UHL.
Pigment Red 52:1, (calcium)	No	BAS, HSH, MGR, SNA, UHL.
Pigment Red 52:2, (manganese)	No	BAS, CGY, HSH, UHL.
Pigment Red 53, (sodium)	No	FAB.
Pigment Red 53:1, (barium)	Yes	AMS, APO, BAS, CMC, FAB, HCL, HIL, HSH, IDC, MGR, MRX, SNA, UHL.
Pigment Red 57	No	BNS.
Pigment Red 57:1, (calcium)	No	AMS, APO, BAS, BNS, CGY, CMC, FAB, HEU, HIL, HSH, IDC, KCW, MGR, POP, SNA, UHL.
Pigment Red 63	No	HSH.
Pigment Red 81, (PMA)	No	BAS, MGR, MRX, SNA, UHL.
Pigment Red 81, (PTA)	Yes	BAS, MGR, MRX, UHL.
Pigment Red 88	No	VPC.
Pigment Red 101	No	BAS.
Pigment Red 122	No	SNA, VPC.
Pigment Red 123	No	IDC, VPC.
Pigment Red 168	No	VPC.
Pigment Red 169	No	MRX.
Pigment Red 179	No	VPC.
Pigment Red 188	No	HCL.
Pigment Red 190	No	VPC.
Pigment Red 200	No	BAS.
Pigment Red 202	No	SNA, VPC.
Pigment Red 209	No	SNA.
Pigment Red 210	No	HCL.
Pigment Red 224	No	VPC.
Pigment Red 245	No	IND.
Pigment Red 63:1, calcium	No	SNA.
All other pigment red toners	No	FAB, UHL.
Violet toners:	Yes	
Pigment Violet 1, (fugitive)	No	KCW, UHL.
Pigment Violet 1, (PMA)	No	MGR, MRX, UHL.
Pigment Violet 1, (PTA)	No	SNA, UHL.
Pigment Violet 3, (fugitive)	No	KCW, MGR, UHL.
Pigment Violet 3, (PMA)	No	BAS, HIL, MGR, MRX, UHL.
Pigment Violet 3, (PTA)	No	MGR, MRX, UHL.
Pigment Violet 4, (fugitive)	No	KCW.
Pigment Violet 19	No	SNA, VPC.
Pigment Violet 23	No	BUC, HCL, IPP, S, SNA, VPC.
Pigment Violet 27	No	MRX.
Pigment Violet 29	No	SNA, VPC.
Pigment Violet 39, (PMA)	No	BAS.

See footnotes at end of table.

Table 16—Continued

Organic pigments for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Organic pigments	Separate statistics[1]	Manufacturers' identification codes (according to list in table 17)
Toners—Continued		
Violet toners—Continued		
All other pigment violet toners	No	BUC, ([2]).
Blue toners:	Yes	
(Basic Blue 7)	No	KCW.
Pigment Blue 1, (PMA)	Yes	BNS, HIL, MGR, MRX, UHL.
Pigment Blue 1, (PTA)	No	MRX.
Pigment Blue 2, (PMA)	No	UHL.
Pigment Blue 14, (PMA)	No	BAS, UHL.
Pigment Blue 15, (α form)	Yes	BAS, CGY, FAB, HEU, HSH, SNA.
Pigment Blue 15:1, (α form)	Yes	CGY, HEU, HIL, SNA, VPC.
Pigment Blue 15:2, (α form)	Yes	CGY, DUP, HEU, HIL, SNA, VPC.
Pigment Blue 15:3, (β form)	Yes	AMS, APO, BAS, CGY, CIK, CMC, HEU, HIL, IDC, IPP, MGR, POP, ROM, SNA, VPC.
Pigment Blue 15:4, (β form)	Yes	BAS, CGY, HEU, POP, SNA, VPC.
Pigment Blue 19	No	PSG.
Pigment Blue 25	No	GLX.
Pigment Blue 61	No	BAS.
Pigment Blue 62	No	MRX.
All other pigment blue toners	No	FAB.
Green toners:	Yes	
Pigment Green 1, (PMA)	No	MRX, UHL.
Pigment Green 2, (PTA)	No	MRX, UHL.
Pigment Green 4, (fugitive)	No	UHL.
Pigment Green 4, (PMA)	No	UHL.
Pigment Green 7	Yes	ALG, BAS, CGY, HCL, HIL, POP, SNA, VPC.
Pigment Green 8	No	KCW.
Pigment Green 10	No	HEU.
Pigment Green 36	Yes	BAS, SNA, VPC.
All other pigment green toners	No	([2]).
Brown toners:	No	
Pigment Brown 5	No	GLX.
Black toners:	No	
Pigment Black 7	No	HCL, VPC.
All other pigment black toners	No	UHL.
Lakes	Yes	
Yellow lakes:	No	
(Acid Yellow 23)	No	MRX.
Orange lakes:		
Pigment Orange 17	No	KCW.
Red lakes:	No	
(Acid Red 26)	No	KCW.
(Basic Red 1)	No	BNS.
(Basic Red 81, PMA)	No	LVR.
Pigment Red 60:1	No	HSH, MRX, SNA.
Pigment Red 83	Yes	HSH, MRX, UHL.
Violet lakes:	No	
(Basic Violet 1)	No	BNS.
(Basic Violet 4)	No	BNS.
(Basic Violet 10)	No	BNS.
Violet 5:1	Yes	HSH, MRX, UHL, VPC.
Blue lakes:	No	
(Basic Blue 14, PMA)	No	LVR.
(Basic Blue 1, PTA)	No	LVR.
Green lakes:	No	
(Basic Green 1, PMA)	No	LVR.

[1] Chemicals for which seperate statistics are reported in this section are indicated by 'Yes.' Chemicals for which data are accepted in confidence and may not be published are indicated by 'No.'
[2] The manufacturer did not consent to his identification with the disignated products.
Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 17
Organic pigments: Directory of manufacturers, alphabetical by code, 1988

Code	*Name of company*	*Code*	*Name of company*
ALE	Alex Color Co.	HEU	Heubach, Inc.
ALG	Allegheny Chemical Corp.	HIL	Hilton Davis Company
AMS	Ridgway Color Co.	HSH	Engelhard Corporation
APO	Apollo Colors, Inc.	IDC	Industrial Color, Inc.
BAS	BASF Corp.	IND	Indol Color Co., Inc.
BNS	Binney and Smith, Inc.	IPP	Spectrachem Corp.
BUC	Synalloy Corp., Blackman Uhler Chemical Div.	KCW	Keystone Color Works, Inc.
		LVR	C. Lever Co., Inc.
CGY	Ciba-Geigy Corp.	MGR	Magruder Color Co., Inc.
CIK	Flint Ink Corp., Cal/Ink Div.	MAX	Max Marx Color Corp.
CMC	Chromatic Color Corp.	POP	Pope Chemical Corp.
DUP	E.I. Dupont De Nemours & Co., Inc., Chemicals and Pigments Dept.	PSG	PMC Specialities Group, Inc.
		ROM	Roma Color, Inc.
FAB	Fabricolor Manufacturing Corp.	S	Sandoz Inc. Colors and Chemicals Div.
GLX	Galaxie Chemical Corp.	SNA	Sun Chemical Corp., Pigment Div.
HCL	Hoechst Celanese Corp.: Rhode Island Works Sou-Tex Works	UHL	Paul Uhlich & Co., Inc.
		VPC	Mobay Chemical Corp., Dyes & Pigments Div.

Note.—Complete names, telephone numbers, and addresses of the above reporting companies are listed in app. A.
Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Section 6

Medicinal Chemicals

Medicinal chemicals include the medicinal and feed grades of all organic chemicals having therapeutic value, whether obtained by chemical synthesis, by fermentation, by extraction from naturally occurring plant or animal substances, or by refining a technical grade product. They include antibiotics and other anti-infective agents, antihistamines, autonomic drugs, cardiovascular agents, central nervous system depressants and stimulants, hormones and synthetic substitutes, vitamins, and other therapeutic agents for human or veterinary use, and for animal feed supplements. Data for the production of these products during 1984–88 are shown in figure 7.

Table 18 shows statistics for production and sales of medicinal chemicals grouped by pharmacological class. The statistics shown are for bulk chemicals only. Finished pharmaceutical preparations and products put up in pills, capsules, tablets, or other measured doses are excluded.[1] The difference between production and sales reflects inventory changes, processing losses, and captive consumption of medicinal chemicals processed into ethical and proprietary pharmaceutical products by the primary manufacturer. In some instances, the difference may also include quantities for medicinal grade products used as intermediates; for example, penicillin V used as an intermediate in the manufacture of other antibiotics. All quantities are given in terms of 100 percent content of the pure bulk drug. Table 19 lists the products reported in this section and indicates the manufacturer(s) of each by code. These codes are identified by company name in table 20.

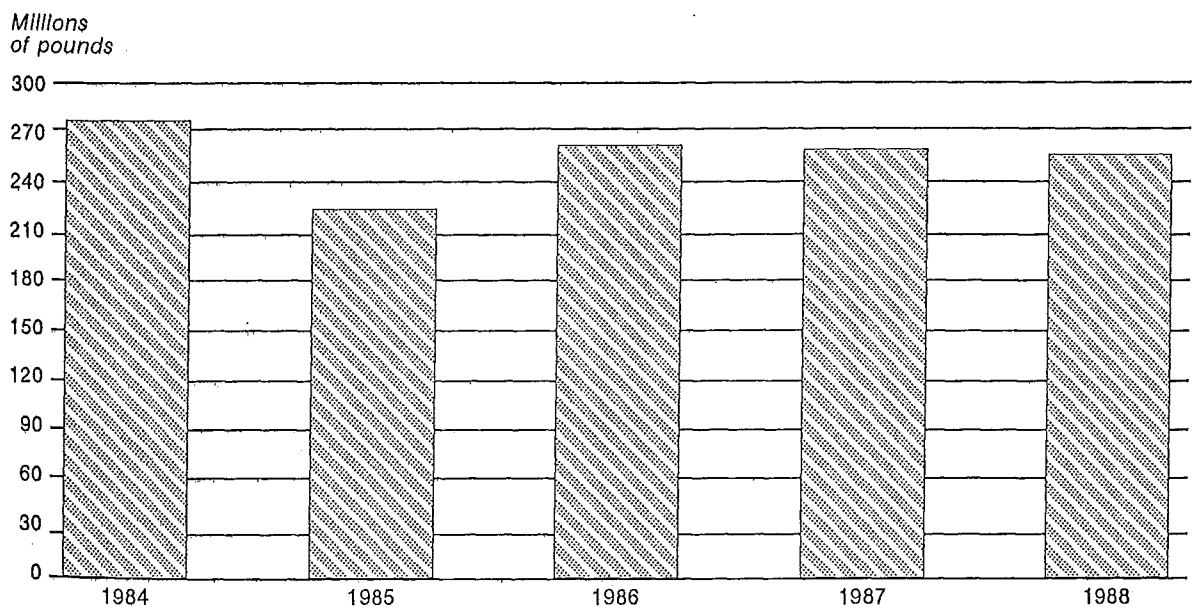
Total U.S. production of bulk medicinal chemicals in 1988 amounted to 258.2 million pounds. Total sales of bulk medicinal chemicals in 1988 amounted to 227.9 million pounds, valued at $1,831.0 million. Beginning in 1980, methionine and most other amino acids and their salts are reported in the section on Miscellaneous End-Use Chemicals and Chemical Products. Section totals are not, therefore, comparable with years prior to 1980.

Production of the larger groups of medicinal chemicals in 1988 was as follows (see table 18): Antibiotics, 28.8 million pounds, 18.9 percent lower than in 1987; anti-infective agents other than antibiotics, 19.1 million pounds, 10.3 percent lower than in 1987; central nervous system depressants and stimulants, 49.2 million pounds, 31.6 percent lower than in 1987; gastrointestinal agents and therapeutic nutrients, 99.7 million pounds, 55.3 percent higher than in 1987; and vitamins, 38.5 million pounds, 25 percent lower than in 1987.

Elizabeth R. Nesbitt
202–252–1355

[1] Complementary statistics on the dollar value of manufacturers' shipments of finished pharmaceutical preparations, except biologicals, are published annually by the U.S. Department of Commerce, Bureau of the Census, in Current Industrial Reports, Series MA-28G. Many pharmaceutical manufacturers that report to the Bureau of the Census are excluded from the U.S. International Trade Commission report because they are not primary producers of medicinal chemicals; that is, they do not themselves produce the bulk drugs which go into their pharmaceutical products, but purchase their drug requirements from domestic or foreign producers.

Figure 7
Medicinal chemicals: U.S. production, 1984–88



Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 18
Medicinal chemicals: U.S. production and sales, 1988

Medicinal chemicals	Production[1]	Sales Quantity	Sales Value	Average Unit value[2]
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Grand total	258,201	227,899	1,831,011	$8.03
Acyclic	99,161	117,018	208,031	1.78
Benzenoid[3]	117,435	81,719	844,467	10.33
Cyclic nonbenzenoid[4]	41,605	29,162	778,513	26.70
Antibiotics, total	28,827	10,247	550,839	53.76
Penicillins, total[5]	6,308	1,577	36,298	23.02
All other antibiotics, total	22,519	8,670	514,541	59.35
For medicinal use[6]	7,466	3,225	430,800	133.58
For nonmedicinal uses[7]	15,053	5,445	83,741	15.38
Antihistamines, total	445	328	48,266	147.15
Antinauseants	45	28	1,173	41.89
All other antihistamines	400	300	47,093	156.98
Anti-infective agents (except antibiotics), total	19,093	8,171	39,362	4.82
Anthelmintics	7,747	3,435	3,265	.95
All other anti-infective agents (except antibiotics)[9]	11,346	4,736	36,097	7.62
Autonomic drugs, total	980	726	21,007	28.94
Sympathomimetic (adrenergic) agents	942	(9)	(9)	(9)
All other autonomic drugs	38	(9)	(9)	(9)
Central depressants and stimulants, total	49,193	54,321	380,406	7.00
Analgesics, antipyretics, and nonhormonal anti-inflammatory agents, total	42,822	50,865	158,301	3.11
Aspirin	23,693	(9)	(9)	(9)
All other analgesics, antipyretics, and nonhormonal anti-inflammatory agents[10]	19,129	50,865	158,301	3.11
Antidepressants	100	36	11,992	333.11
Antitussives	262	390	49,652	127.31
All other central depressants and stimulants[11]	6,009	3,030	160,461	52.96
Dermatological agents	15,012	7,446	7,052	.95
Expectorants and mucolytic agents	1,111	883	7,836	8.87
Gastrointestinal agents and therapeutic nutrients[12]	99,713	115,743	85,663	.74
Vitamins[13]	38,542	26,898	121,529	4.52
Miscellaneous medicinal chemicals[14]	5,285	3,136	569,051	181.46

[1] The data on production and sales are for bulk medicinal chemicals only. Methionine and most other amino acids and their salts are now reported in the section on Miscellaneous End-Use Chemicals and Chemical Products. Section totals are not, therefore, comparable with years prior to 1980.
[2] Calculated from rounded figures.
[3] Benzenoid, as used in this report, describes any cyclic medicinal chemical whose molecule contains either a 6-membered carbocyclic ring with conjugated double bonds or a 6-membered heterocyclic ring with 1 or 2 hetero atoms and conjugated double bonds, except the pyrimidine ring.
[4] Includes antibiotics of unknown structure.
[5] Includes semisynthetic penicillins and all other penicillins.
[6] Includes production and sales of antifungal and antitubercular antibiotics, tetracyclines, and cephalosporins.
[7] Includes production and sales of tetracyclines.

Footnotes for table 18—Continued

[8] Includes production and sales of antiprotozoan agents, sulfonamides, and urinary antiseptics; does not include production of sulfaguanidine used as an intermediate in the production of anti-infective sulfonamides.

[9] Reported data were accepted in confidence and may not be published, or no data were reported.

[10] Includes sales quantity and value of aspirin.

[11] Includes production and sales of amphetamines; general anesthetics; respiratory and cerebral stimulants; skeletal muscle relaxants; tranquilizers; and anticonvulsants, hypnotics, and sedatives.

[12] Methionine and its salts are reported in the section in Miscellaneous End-Use Chemicals and Chemical Products under amino acids.

[13] Includes production and sales of vitamin A, vitamin B, vitamin C, vitamin D, vitamin E, and vitamin K.

[14] Includes production and sales of antineoplastic agents, cardiovascular agents, diagnostic agents, hematological agents, renal-acting and edema-reducing agents, and unclassified medicinal chemicals. Also includes production and sales of local anesthetics, smooth muscle relaxants (including theophylline derivatives), and hormones and synthetic substitutes.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 19

Medicinal chemicals for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Medicinal chemicals	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 20)*
Antibiotics:	Yes	
Cephalosporins:	No	
Cefaclor	No	LIL.
Cefamandole	No	LIL.
Cefazolin, sodium	No	LIL.
Cefoxitin	No	MRK.
Cephalexin	No	BOC, LIL, TRD.
Cephalothin, sodium	No	LIL.
Cephradine	No	PFZ, TRD.
Penicillins:	Yes	
Penicillins, semisynthetic:		
Amoxicillin:		
Amoxicillin (trihydrate)	No	BEE, BOC, BRS, KAN.
Amoxicillin (anhydrous)	No	BEE, BRS.
Ampicillin:		
Ampicillin (anhydrous)	No	BRS.
Ampicillin (trihydrate)	No	BOC, BRS, KAN.
Other semisynthetic penicillins:		
Ampicillin, sodium	No	BEE, BRS, WYT.
Carbenicillin, disodium	No	PFZ.
Carbenicillin indanyl, sodium	No	BEE.
Cloxacillin, sodium	No	BEW, BOC.
Cyclacillin	No	BOC.
Dicloxacillin, sodium	No	BEE, BOC, WYT.
Hetacillin, potassium	No	BRS.
Nafcillin, sodium	No	BEE, WYT.
Oxacillin, sodium	No	BEE, BOC.
Piperacillin	No	BRS.
Ticarcillin, disodium	No	BEE, BEW.
All other semisynthetic penicillins	No	BEE.
Penicillins (except semisynthetic):		
For medicinal use:		
Penicillin G, benzathine	No	WYT.
Penicillin G, potassium	No	PFZ.
Penicillin V, potassium	No	LIL, PFZ.
Penicillin G, procaine (medicinal grade)	No	PFZ, WYT.
For nonmedicinal uses:		
Penicillin G, procaine (animal feed grade)	No	PFZ.
Tetracyclines:		
For medicinal use:		
Chlortetracycline (medicinal grade)	No	ACY.
Minocycline	No	ACY.
Oxytetracycline (medicinal grade)	No	PFZ.
Tetracycline	No	ACY.
For nonmedicinal uses:		
Chlortetracycline (animal feed grade)	No	ACY, PFZ.
Oxytetracycline (animal feed grade)	No	PFZ.
Other antibiotics:		
For medicinal use:	Yes	
Antifungal antibiotics:	Yes	
Amphotericin B	No	PEN, TRD.
Nystatin (medicinal grade)	No	ACY, TRD.
Tobramycin	No	LIL.
Antitubercular antibiotics:	No	
Cycloserine	No	LIL.
Dihydrostreptomycin	No	PFZ.
Other antibiotics for medicinal use:	No	
Apramycin	No	LIL.
Aztreonam	No	TRD.
Cefonicid	No	SK.

See footnotes at end of table.

Table 19—Continued

Medicinal chemicals for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Medicinal chemicals	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 20)*
Antibiotics—Continued	Yes	
Other antibiotics—Continued	Yes	
For medicinal use—Continued		
Other antibiotics for medicinal use—Continued		
Cefuroxime	No	LIL.
Clindamycin	No	ABB, UPJ.
Erythromycin	No	ABB, ANG, UPJ.
Erythromycin estolate	No	LIL.
Erythromycin stearate	No	UPJ.
Erythromycin succinate	No	ANG.
Erythromycin thiocyanate	No	ANG.
Gentamycin	No	SCH.
Imipenem	No	MRK.
Kanamycin	No	BRS.
Lincomycin (medicinal grade)	No	UPJ.
Neomycin (medicinal grade)	No	UPJ.
Netilmicin	No	SCH.
Novobiocin, sodium	No	UPJ.
Polymyxin B	No	PFZ.
Sisomycin	No	SCH.
Spectinomycin (medicinal grade)	No	ABB, UPJ.
Thiostrepton	No	TRD.
Vancomycin	No	ABB, ACY, LIL.
All other antibiotics, for medicinal use	No	ABB, RSA.
For nonmedicinal uses:	Yes	
Bacitracin (animal feed grade)	No	IMC.
Cycloheximide	No	UPJ.
Hygromycin B	No	LIL.
Lasalocid, sodium	No	HOF.
Lincomycin (animal feed grade)	No	UPJ.
Monesin	No	LIL.
Neomycin (animal feed grade)	No	PFZ, UPJ.
Novobiocin (animal feed grade)	No	UPJ.
Spectinomycin (animal feed grade)	No	UPJ.
Streptomycin	No	PFZ.
Tylosin	No	LIL.
Antihistamines:	Yes	
Antinauseants:	Yes	
Dimenhydrinate	No	GAN.
Meclizine hydrochloride	No	PFZ.
Metoclopramide hydrochloride	No	LLI.
Trimethobenzamide hydrochloride	No	HOF.
Other antihistamines:	Yes	
Brompheniramine maleate	No	HEX, LLI.
Chlorpheniramine maleate	No	HEX.
Chlorpheniramine tannate	No	HEX.
Cyproheptadine hydrochloride	No	MRK.
Dexbrompheniramine maleate	No	ABB, HEX.
Dimethindene maleate	No	CGY.
Diphenhydramine citrate	No	WYK.
Diphenhydramine hydrochloride	No	PD.
Doxylamine succinate	No	BKC.
Laradine	No	SCH.
Phenindamine tartrate	No	HOF.
Phenyltoloxamine citrate	No	GAN.
Pyrilamine maleate	No	HEX.
Pyrilamine tannate	No	HEX.
Terfenadine	No	DOW.
Tripelennamine	No	CGY.
Tripelennamine citrate	No	CGY.

See footnotes at end of table.

Table 19.—Continued

Medicinal chemicals for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Medicinal chemicals	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 20)*
Antihistamines—Continued	Yes	
Other antihistamines—Continued	Yes	
Tripelennamine hydrochloride	No	CGY.
Triprolidine hydrochloride	No	AMD, BUR.
Anti-infective agents (except antibiotics):	Yes	
Anthelmintics:	Yes	
Clorsulon	No	MRK.
Diethylcarbamazine citrate	No	SK.
Ivermectin	No	MRK.
Piperazine	No	TX, UCC.
Piperazine dihydrochloride	No	FLM.
Piperazine hexahydrate	No	BRS.
Piperazine hydrochloride	No	FLM.
Piperazine sulfate	No	FLM.
Pyrantel pamoate	No	PFZ.
Thiabendazole	No	MRK.
Antiprotozoan agents:	No	
Arsenic and bismuth compounds:	No	
Arsanilic acid	No	FLM.
Nitarsone	No	SAL.
Roxarsone	No	SAL.
Roxarsone, sodium	No	SAL.
Other antiprotozoan agents:		
Amprolium	No	MRK.
Dinitolmide	No	SAL.
Ethopabate	No	MRK.
Hydroxychloroquine sulfate	No	SD.
Iodochlorhydroxyquin	No	CGY.
Metronidazole	No	SRL.
Nitromide	No	SAL.
Sulfonamides:	No	
Mafenide	No	SDW.
Mafenide acetate	No	SDW.
Sulfabenzamide	No	ACY.
Sulfacetamide, sodium	No	SCH.
Sulfadiazine	No	ACY, BOT.
Sulfadiazine, silver	No	LEM.
Sulfadimethoxine	No	HOF.
Sulfamethazine	No	SAL.
Sulfamethazine, sodium	No	SAL.
Sulfamethizole	No	ACY.
Sulfamethoxazole	No	HOF.
Sulfanitran	No	SAL.
Sulfasalazine	No	SAL.
Sulfathiazole, sodium	No	SAL.
Sulfisoxazole	No	HOF.
Sulfisoxazole, acetyl	No	HOF.
Urinary antiseptics:		
Methenamine	No	ARN.
Methenamine hippurate	No	RIK.
Methenamine mandelate	No	ARN, PD.
Other anti-infective agents:	No	
Antifungal agents:	No	
Benzoic acid	No	KLM.
Calcium undecylenate	No	WTL.
Sodium caprylate	No	LEM.
Zinc undecylenate	No	WTL.
All other antifungal agents	No	ARN.
Antileprotic and antitubercular agents:	No	
Aminosalicylic acid	No	HXL.

See footnotes at end of table.

Table 19—Continued

Medicinal chemicals for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Medicinal chemicals	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 20)*
Anti-infective agents (except antibiotics)—Continued	Yes	
Other anti-infective agents—Continued		
Antileprotic and antitubercular agents—Continued	No	
Sodium aminosalicylate	No	HXL.
Sulfoxone, sodium	No	ABB.
Antiviral agents:	No	
Acyclovir	No	BUR.
Amantadine hydrochloride	No	HEX.
Azidothymidine	No	BUR.
Rimantidine hydrochloride	No	HOF.
Antiviral agents, all other	No	([2]).
General antiseptics and antibacterial agents:	No	
Bromchlorenone	No	MHI.
Capreomycin	No	LIL.
Ceftazidime	No	LIL, MRK, SK, ([2]).
Ceftazidime dihydrochloride	No	SK.
Cetylpyridinium chloride	No	HXL.
Cinoxacin	No	LIL.
m-Cresyl acetate	No	ADC.
8-Hydroxy-5-quinolinesulfonic acid	No	MRK.
Iodoform	No	DPW, MAL.
Magnesium salicylate	No	ARN.
Ormetoprim	No	HOF.
Pentamidine isethionate	No	MRX.
Povidone - Iodine	No	GAF.
Resorcinol	No	KPT.
Trimethoprim	No	BUR.
Autonomic drugs:	Yes	
Sympathomimetic agents:	Yes	
Albuterol sulfate	No	SCH.
Dobutamine	No	LIL.
Methoxyphenamine hydrochloride	No	HXL.
Naphazoline hydrochloride	No	CGY.
Phenylephrine bitartrate	No	GAN.
Phenylephrine hydrochloride	No	GAN, SDW.
Phenylephrine tannate	No	HEX.
Phenylpropanolamine bitartrate	No	ARS.
Phenylpropanolamine hydrochloride	No	ARS, GAN, HXL, ORT.
Propylhexedrine	No	SK.
Pseudoephedrine hydrochloride	No	BUR, GAN.
Pseudoephedrine sulfate	No	GAN.
Terbutaline sulfate	No	CGY.
Tetrahydrozoline hydrochloride	No	PFZ.
All other sympathomimetic (adrenergic) agents	No	ARN.
Other autonomic drugs:	Yes	
Parasympatholytic quaternary ammonium compounds (except tropane derivatives):	No	
Glycopyrrolate	No	LLI.
Isopropamide iodide	No	SK.
Propantheline bromide	No	SRL.
Parasympatholytic tertiary amines (except tropane derivatives):		
Oxybutynin chloride	No	ABB.
Oxyphencyclimine hydrochloride	No	PFZ.
Parasympatholytic tropane derivatives:		
Benztropine mesylate	No	MRK, ([2]).
Parasympathomimetic agents:		
Bethanechol chloride	No	GAN, MRK.
Neostigmine methylsulfate	No	HOF.
Pyridostigmine bromide	No	HOF.

See footnotes at end of table.

Table 19—Continued

Medicinal chemicals for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Medicinal chemicals	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 20)*
Autonomic drugs—Continued	Yes	
Other autonomic drugs—Continued	Yes	
Sympatholytic agents:		
Timolol maleate	No	MRK.
Central depressants and stimulants:	Yes	
Analgesics, antipyretics, and nonhormonal anti-inflammatory agents:	Yes	
Acetaminophen	No	MAL, MON, SDW.
Aspirin	Yes	DOW, MON, NOR, SD.
Aurothioglucose	No	SCH.
Choline magnesium salicylate	No	LEM.
Difunisal	No	MRK.
Fenoprofen	No	LIL, WYK.
Fentanyl citrate	No	MRX.
Flunixin	No	SCH.
Gold sodium thiomalate	No	MRX.
Hydromorphone hydrochloride	No	PEN.
Ibuprofen	No	TNA, UPJ.
Indomethacin	No	MRK.
Meclofenamate, sodium	No	PD, WYK.
Meclofenamic acid	No	PD.
Mefenamic acid	No	PD.
Meperidine hydrochloride	No	PEN, SDW.
Methadone hydrochloride	No	MAL.
Morphine sulfate	No	MAL, PEN, SAL.
Oxycodone hydrochloride	No	DUP, MAL, PEN.
Oxycodone terephthalate	No	PEN.
Pentazocine	No	SD.
Pentazocine hydrochloride	No	SD.
Phenylbutazone	No	CGY.
Piroxicam	No	PFZ.
Potassium aminobenzoate	No	GAN.
Potassium salicylate	No	KLM.
Propoxyphene hydrochloride	No	ABB, GAN, LIL.
Propoxyphene napsylate	No	ABB, GAN, LIL.
Salsalate	No	WYK.
Sodium aminobenzoate	No	GAN.
Sodium salicylate	No	KLM.
Sufentanil citrate	No	MRX.
Sulindac	No	MRK.
Anticonvulsants, hypnotics, and sedatives:		
Anticonvulsants (except barbiturates):	No	
Ethosuximide	No	PD.
Ethotoin	No	ABB.
Methsuximide	No	PD.
Phensuximide	No	PD.
Phenytoin	No	PD.
Phenytoin, sodium	No	PD.
Valproic acid	No	ABB.
Barbiturates:	No	
Amobarbital	No	GAN.
Amobarbital, sodium	No	GAN.
Butabarbital	No	GAN.
Butabarbital, sodium	No	ABB.
Butalbital	No	GAN.
Pentobarbital	No	GAN.
Phenobarbital	No	GAN.
Phenobarbital, sodium	No	GAN.
Poly(oxy-1,2-ethanediyl)-α-carboxymethyl, omega-(tridecyloxy), potassium salt	No	GAN.

See footnotes at end of table.

Table 19—Continued

Medicinal chemicals for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Medicinal chemicals	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 20)*
Central depressants and stimulants—Continued		
Anticonvulsants, hypnotics, and sedatives—Continued		
Barbiturates—Continued		
Secobarbital	No	GAN.
Secobarbital, sodium	No	GAN.
Thiamylal, sodium	No	ABB, PD.
Thiopental, sodium	No	ABB.
Hypnotics and sedatives (except barbiturates):	No	
Ethchlorvynol	No	ABB.
Glutethimide	No	GAN.
Methyprylon	No	HOF.
All other hypnotics and sedatives, other than barbiturates	No	UPJ.
Antidepressants:	Yes	
Amitriptyline hydrochloride	No	MRK.
Amoxapine	No	WYK.
Doxepin hydrochloride	No	PFZ.
Fluoxetine	No	LIL.
Imipramine hydrochloride	No	CGY.
Maprotiline hydrochloride	No	ABB, CGY.
Nortriptyline hydrochloride	No	LIL.
Protriptyline hydrochloride	No	MRK, WYK.
Antitussives:	Yes	
Benzonatate	No	CGY.
Codeine	No	MAL, PEN.
Dextromethorphan hydrobromide	No	AMD, HOF.
Hydrocodone bitartrate	No	MAL, PEN.
Noscapine	No	MAL, PEN.
Thebaine	No	MAL, PEN.
Tranquilizers:	No	
Phenothiazine derivatives:	No	
Chlorpromazine hydrochloride	No	SK.
Fluphenazine hydrochloride	No	TRD.
Perphenazine	No	SCH.
Other tranquilizers:	No	
Clorazepate dipotassium	No	ABB.
Haloperidol	No	SRL.
Hydroxyzine hydrochloride	No	LEM, PFZ.
Hydroxyzine pamoate	No	PFZ.
Loxapine succinate	No	WYK.
Prazepam	No	PD.
Thiothixene hydrochloride	No	PFZ.
Other central depressants and stimulants:	Yes	
Amphetamines:	No	
Dextroamphetamine sulfate	No	ARN.
Methamphetamine hydrochloride	No	ARN.
General anesthetics:		
Enflurane	No	OH.
Isoflurane	No	OH.
Ketamine hydrochloride	No	BRS, PD.
Respiratory and cerebral stimulants:	No	
Caffeine (natural and synthetic):		
Caffeine, natural	No	CPR, GNF.
Caffeine, synthetic	No	PFZ.
Other respiratory and cerebral stimulants:	No	
Diethylpropion hydrochloride	No	GAN.
Doxapram hydrochloride	No	LLI.
Methylphenidate hydrochloride	No	CGY.
Pemoline	No	ABB.
Phendimetrazine	No	GAN.
Phentermine	No	GAN, SDW.
Phentermine hydrochrloride	No	HEX.

See footnotes at end of table.

Table 19—Continued

Medicinal chemicals for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Medicinal chemicals	Separate statistics[1]	Manufacturers' identification codes (according to list in table 20)
Central depressants and stimulants—Continued		
Other central depressants and stimulants—Continued		
Skeletal muscle relaxants:	No	
Chlorphenesin carbamate	No	UPJ.
Cyclobenzaprine hydrochloride	No	MRK.
Methocarbamol	No	LLI.
Orphenadrine citrate	No	ABB, WYK.
Succinylcholine chloride	No	ABB, BUR.
Tubocurarine	No	ABB.
All other skeletal muscle relaxants	No	UPJ.
Dermatological agents:	Yes	
Aluminum phenolsulfonate	No	SAL.
Ammonium phenolsulfonate	No	SAL.
Salicylic acid	No	DOW, KLM, MON.
Zinc phenolsulfonate	No	MAL, SAL.
Zinc salicylate	No	RSA.
Expectorants and mucolytic agents:		
Ethylenediamine dihydroiodide	No	AJY, DPW.
Guaifenesin	No	LLI, NOR.
Iodinated glycerol	No	([2]).
Gastrointestinal agents and therapeutic nutrients:	Yes	
Gastrointestinal agents:	No	
Choline chloride (all grades):	No	
Choline chloride (animal feed grade)	No	CHO, HFT, NUT, TMH.
Choline chloride (medicinal grade)	No	CHO, HFT.
Other gastrointestinal agents:	No	
Acetylcholine chloride	No	RSA.
Betaine hydrochloride	No	CHO, HFT.
Calcium polycarbophil	No	DAN, LLI.
Choleretics and hydrocholeretics	No	UPJ.
Choline bicarbonate	No	CHO, HFT.
Choline bitartrate	No	CHO, HFT.
Choline citrate	No	CHO.
Choline dihydrogen citrate	No	CHO, HFT.
Cimetidine	No	SK.
Cimetidine hydrochloride	No	SK.
Colestipol hydrochloride	No	UPJ.
Dihydroxyaluminum aminoacetate	No	CHT.
Diphenoxylate	No	MAL.
Docusate, calcium	No	MAL.
Docusate, potassium	No	ACY.
Docusate, sodium	No	ACY, MAL.
Famotidine	No	MRK.
Gemfibrozil	No	PD.
Methscopolamine bromide	No	UPJ.
Nizatidine	No	LIL.
Probucol	No	DOW.
Sucralfate	No	SK.
Therapeutic nutrients:	No	
Calcium gluceptate	No	PFN.
Copper gluconate	No	PFZ.
Magnesium gluconate	No	PFZ.
Manganese gluconate	No	PFZ.
Potassium gluconate	No	PFZ.
Zinc gluconate	No	PFZ.
Hormones and synthetic substitutes:	No	
Anabolic agents and androgens:	No	
Androstenedione	No	UPJ.
Fluoxymesterone	No	UPJ.

See footnotes at end of table.

Table 19—Continued

Medicinal chemicals for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Medicinal chemicals	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 20)*
Hormones and synthetic substitutes—Continued		
Anabolic agents and androgens—Continued		
Methyltestosterone	No	(2).
Testosterone	No	(2).
Testosterone cypionate	No	(2).
Testosterone propionate	No	(2).
Zeranol	No	IMC.
All other anabolic agents and androgens	No	UPJ.
Corticosteroids:	No	
Aclomethasone	No	SCH.
Beclomethasone	No	SCH.
Betamethasone	No	SCH, (2).
Betamethasone dipropionate	No	SCH.
Betamethasone sodium phosphate	No	SCH.
Betamethasone valerate	No	SCH.
Cortisone acetate	No	MRK, UPJ.
Dexamethasone	No	MRK, (2).
Dexamethasone acetate	No	MRK.
Dexamethasone sodium phosphate	No	MRK, (2).
Diflorasone diacetate	No	UPJ.
Fludrocortisone acetate	No	UPJ.
Fluorometholone	No	UPJ.
Halcinonide	No	TRD.
Hydrocortisone	No	UPJ.
Hydrocortisone acetate	No	UPJ.
Isoflupredone, acetate	No	(2).
Medrysone	No	UPJ.
Methylprednisolone	No	ABB, UPJ.
Prednisolone	No	MRK, UPJ.
Prednisolone acetate	No	UPJ.
Prednisone	No	UPJ.
Triamcinolone	No	TRD, (2).
Triamcinolone acetonide	No	TRD, (2).
Triamcinolone diacetate	No	TRD, (2).
Estrogens and progestogens:	No	
Estrogens:	No	
Estradiol cypionate	No	UPJ.
Estrogens, conjugated	No	ORG.
Estrogens, esterified	No	ORG.
All other estrogens	No	ORG.
Progestogens:	No	
Dinoprostone	No	UPJ.
Hydroxyprogesterone caproate	No	UPJ.
Medroxyprogesterone acetate	No	(2).
Megestrol acetate	No	UPJ.
Melengestrol acetate	No	UPJ.
Progesterone	No	UPJ.
All other progestins	No	UPJ.
Synthetic hypoglycemic agents:		
Acetohexamide	No	LIL.
Chlorpropamide	No	PFZ.
Glipizide	No	PFZ.
Tolazamide	No	(2).
Tolbutamide	No	UPJ.
Thyroid hormone and antithyroid agents:	No	
Methimazole	No	LIL.
Thyroglobulin	No	NEP.
Thyroid	No	ARP.

See footnotes at end of table.

Table 19—Continued

Medicinal chemicals for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Medicinal chemicals	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 20)*
Hormones and synthetic substitutes—Continued		
Other hormones and synthetic substitutes:	No	
Calcitonin	No	ARP.
Corticotropin	No	ARP, ORG.
Danazol	No	SD.
Flutamide	No	SCH.
Gonadorelin, acetate	No	ABB.
Humatrope	No	LIL.
Insulin	No	LIL.
Local anesthetics:	No	
Benzocaine	No	MAL, WYK.
Butamben	No	ABB, WYK.
Dibucaine	No	CGY.
Dibucaine hydrochloride	No	CGY.
Lidocaine	No	LEM, WYK.
Lidocaine hydrochloride	No	LEM, WYK.
Pramoxine hydrochloride	No	ABB.
Tetracaine hydrochloride	No	UPJ.
Renal-acting and edema-reducing agents:	No	
Benzothiadiazine derivatives:	No	
Benzthiazide	No	PFZ.
Chlorothiazide	No	MRK.
Hydrochlorothiazide	No	CGY, MRK.
Polythiazide	No	PFZ.
Other renal-acting and edema-reducing agents:	No	
Amiloride hydrochloride	No	MRK.
Canrenoate, potassium	No	SRL.
Ethacrynic acid	No	MRK.
Furosemide	No	SAL.
Probenecid	No	MRK, SAL.
Spironolactone	No	SRL.
Triamterene	No	GAN, SK.
Smooth muscle relaxants:	No	
Atracurium besylate	No	BUR.
Flavoxate hydrochloride	No	SK.
Oxtriphylline	No	PD.
Theophylline sodium glycinate	No	CHT.
Vitamins:	Yes	
Vitamin A:	No	
Beta carotene (provitamin A)	No	HOF.
Tretinoin (vitamin A acid)	No	EK.
Vitamin A acetate (animal feed grade)	No	HOF.
Vitamin A acetate (medicinal grade)	No	HOF.
Vitamin A alcohol	No	EK, HOF.
Vitamin A palmitate (medicinal grade)	No	HOF.
All other vitamin A	No	EK.
Vitamin B-complex:	No	
Niacin and derivatives:	No	
Niacin (medicinal grade)	No	RIL.
Niacinamide (medicinal grade)	No	NEP, RIL.
Niacinamide hydroiodide	No	DPW.
Pantothenic acid derivatives:		
Dexpanthenol	No	HOF.
Panthenol	No	HOF.
Other B-complex vitamins:		
Biotin	No	HOF.
Cyanocobalamin (animal feed grade)	No	MRK.
Cyanocobalamin (U.S.P. crystalline)	No	MRK.
Riboflavin (animal feed grade)	No	MRK.
Riboflavin (medicinal grade)	No	HOF.

See footnotes at end of table.

Table 19—Continued

Medicinal chemicals for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Medicinal chemicals	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 20)*
Vitamins—Continued		
Vitamin B-Complex—Continued		
Other B-Complex vitamins—Continued		
Riboflavin-5-phosphate, sodium	No	HOF.
Thiamine hydrochloride	No	HOF.
Thiamine mononitrate	No	HOF.
Vitamin C:		
Ascorbic acid	No	HOF.
Calcium ascorbate	No	HOF.
Sodium ascorbate	No	HOF.
Vitamin D:		
Cholecalciferol (vitamin D)	No	DUP.
7-Dehydrocholesterol (provitamin D)	No	DUP.
Ergocalciferol (vitamin D)	No	VTM.
All other vitamin D	No	UPJ.
Vitamin E:	No	
Dl-alpha tocopheryl acetate (all grades):	No	
dl-α Tocopheryl acetate (animal feed grade)	No	BAS, HOF.
dl-α Tocopheryl acetate (medicinal grade)	No	BAS, HOF.
Other vitamin E:		
d-α Tocopherol	No	EKT.
dl-α Tocopherol	No	HOF.
d-α Tocopheryl acetate	No	EKT.
d-α Tocopheryl acid succinate	No	EKT.
Miscellaneous medicinal chemicals:	Yes	
Antineoplastic agents:	No	
Azathioprine	No	BUR.
Carboplatin	No	MRX.
Cisplatin	No	MRX.
Cytarabine	No	PFN, UPJ.
Leuprolide acetate	No	ABB.
Methotrexate	No	BRS.
Procarbazine hydrochloride	No	BRS, HOF.
Streptozocin	No	PFN, UPJ.
Tilomisole	No	TNA.
Vinblastine sulfate	No	LIL.
Vincristine sulfate	No	LIL.
All other antineoplastic agents	No	([2]).
Cardiovascular agents:	No	
Antihypertensive agents:	No	
Captopril	No	TRD.
Diazoxide	No	SCH.
Dilevalol hydrochloride	No	SCH.
Hydralazine hydrochloride	No	CGY.
Lisinopril	No	MRK.
Methyldopa	No	MRK.
Metoprolol tartrate	No	CGY.
Minoxidil	No	UPJ.
Nadolol	No	TRD.
Prazosin hydrochloride	No	ABB, PFZ.
Sodium nitroprusside	No	ABB.
Terazosin	No	ABB.
Enalapril maleate	No	MRK.
Vasodilators:	No	
Nicotinyl alcohol tartrate	No	ARN.
Nifedipine	No	PFZ.
Other cardiovascular agents:	No	
Diltiazen hydrochloride	No	ABB.
Disopyramide phosphate	No	SRL.
Lovastatin	No	MRK.

See footnotes at end of table.

Table 19—Continued

Medicinal chemicals for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Medicinal chemicals	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 20)*
Miscellaneous medicinal chemicals—Continued		
Cardiovascular agents—Continued		
Other cardiovascular agents—Continued		
Procainamide hydrochloride	No	PD, WYK.
Propranolol hydrochloride	No	WYK.
Simvastatin	No	MRK.
Tocainide	No	MRK, SDW.
Diagnostic agents:	No	
Roentgenographic contrast media:	No	
Diatrizoate, sodium	No	SDW.
Iohexol	No	SD.
Iothalamate, meglumine	No	MAL.
Other diagnostic agents:	No	
Albumin	No	SPR.
Aminohippuric acid	No	WYK.
Edrophonium chloride	No	MRX.
Glutamyl-p-nitroaniline (liver function test)	No	REG.
Metyrapone	No	CGY.
Xylose (intestinal malabsorption test)	No	PFN.
All other diagnostic agents, other than roentgenographic contrast media	No	PFZ.
Hematological agents:	No	
Anticoagulants:	No	
Ammonium heparin	No	SPR.
Benzalkonium heparin	No	RIK.
Lithium heparin	No	SPR.
Potassium warfarin	No	([2]).
Sodium heparin	No	SPR.
Warfarin	No	SDW.
Other hematological agents:	No	
Cellulose, oxidized	No	EKT.
Dextran	No	PHR.
Unclassified medicinal chemicals:	No	
Allopurinol	No	BUR.
Carbidopa	No	MRK.
Disulfuram	No	ABB.
Etidronate, disodium	No	NOR.
Levodopa	No	SRL.
Nicotine polacrilex	No	WYK.
Thuringiensin	No	ABB.
All other medicinal chemicals	No	ABB, BIB, ([2]).

[1] Chemicals for which separate statistics are reported in this section are indicated by 'Yes.' Chemicals for which data are accepted in confidence and may not be published are indicated by 'No.'
[2] The manufacturer did not consent to his identification with the designated products.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 20
Medicinal chemicals: Directory of manufacturers, alphabetical by code, 1988

Code	*Name of company*
ABB	Abbott Laboratories
ACY	American Cyanamid Co.
ADC	Anderson Development Co.
AJY	Ajay Chemicals, Inc.
AMD	Cyclo Products, Inc.
ANG	Angus Chemical Co.
ARN	Arenol Chemical Corp.
ARP	Armour Pharmaceutical Co.
ARS	Arsynco, Inc.
BAS	BASF Corp.
BEE	Beecham, Inc.: Beecham Laboratories Div.
BEW	Beecham Western Hemisphere Inc.
BIB	Beckman Instruments, Inc., Spinco Div.
BKC	J. T. Baker Chemical Co.
BOC	Biocraft Laboratories, Inc.
BOT	The Boots Company
BRS	Bristol-Myers Co.
BUR	Burroughs Wellcome Co.
CGY	Ciba-Geigy Corp.
CHO	Ducon
CHT	Chattem, Inc.
CPR	Certified Processing Corp.
DAN	Dan River, Inc., Chemical Products Div.
DOW	Dow Chemical Co.
DPW	Deepwater, Inc.
DUP	E. I. duPont de Nemours & Co., Inc. Medical Products Dept.
EK	Eastman Kodak Co.:
EKT	Tennessee Eastman Co. Div.
FLM	Fleming Laboratories, Inc.
GAF	GAF Corp., Chemical Group
GAN	Gane's Chemicals, Inc.
GNF	General Foods Manufacturing Corp., Maxwell House Div.
HEX	Hexagon Laboratories, Inc.
HFT	Syntex Agribusiness, Inc., Nutrition & Chemical Div.
HOF	Hoffmann-LaRoche, Inc.
HXL	Hexcel Corp., Hexcel Chemical Products
IMC	Pitman-Moore, Inc.,
KAN	Kanasco, LTD
KLM	Kalama Chemical, Inc.
KPT	Beazer Materials & Services, Inc.
LEM	Napp Chemicals, Inc.
LIL	Eli Lilly & Co., U.S. and Puerto Rico
LLI	Lee Laboratories, Inc.
MAL	Mallinckrodt, Inc.
MHI	Morton-Thiokol, Inc., Ventron Div.
MON	Monsanto Co.
MRK	Merck & Co., Inc.
MRX	Johnson Matthey, Inc.
NEP	Nepera Inc.
NOR	Norwich Eaton Pharmaceutical, Inc.
NUT	Nutrius, Inc.
OH	Anaquest
ORG	Organics/LaGrange, Inc.
ORT	Roehr Chemicals, Inc., Div. of Aceto Corp.
PD	Parke-Davis Div. of Warner-Lambert Co.
PEN	Penick Corp.
PFN	Pfanstiehl Laboratories, Inc.
PFZ	Pfizer, Inc. & Pfizer Pharmaceuticals, Inc.
PHR	Pharmachem Corp.
REG	Regis Chemical Co.
RIK	Riker Laboratories, Inc. Sub of 3M Co.
RIL	Reilly Industries, Inc.
RSA	R.S.A. Corp.
SAL	Salsbury Laboratories, Inc.
SCH	The Schering Corp.
SD	Sterling Drug, Inc.:
SD	Sterling Pharmaceuticals, Inc.
SDW	Sterling Organics Div.
SK	SmithKline Chemicals
SPR	Scientific Protein Laboratories
SRL	G.D. Searle & Co.
TMH	Harcros Chemicals, Inc.
TNA	Ethyl Corp.
TRD	Squibb Manufacturing, Inc.
TX	Texaco Inc., Texaco Chemical Co.
UCC	Union Carbide Corp.
UPJ	Upjohn Co.
VTM	Vitamins, Inc.
WTL	Pennwalt Corp., Lucidol Div.
WYK	Wyckoff Chemical Co., Inc.
WYT	Wyeth Laboratories, Inc., Wyeth Laboratories Div. of American Home Products Corp.

Note.—Complete names, telephone numbers, and addresses of the above reporting companies are listed in app. A.
Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Section 7

Flavor and Perfume Materials

Flavor and perfume materials are organic chemicals used to impart flavors and aromas to foods, beverages, cosmetics, and soaps. These aroma chemicals are also utilized to neutralize or mask unpleasant odors in industrial processes and products, as well as in consumer products.

Total domestic production of flavor and perfume materials in 1988 amounted to 162.1 million pounds (see figure 8). Sales of these materials in 1988 amounted to 95.0 million pounds, valued at $866.1 million, compared with 81.5 million pounds, valued at $726.3 million, in 1987. U.S. production of flavor and perfume materials in 1988 increased by 28.5 percent from the level in 1987 while the value of sales increased by 19.3 percent.

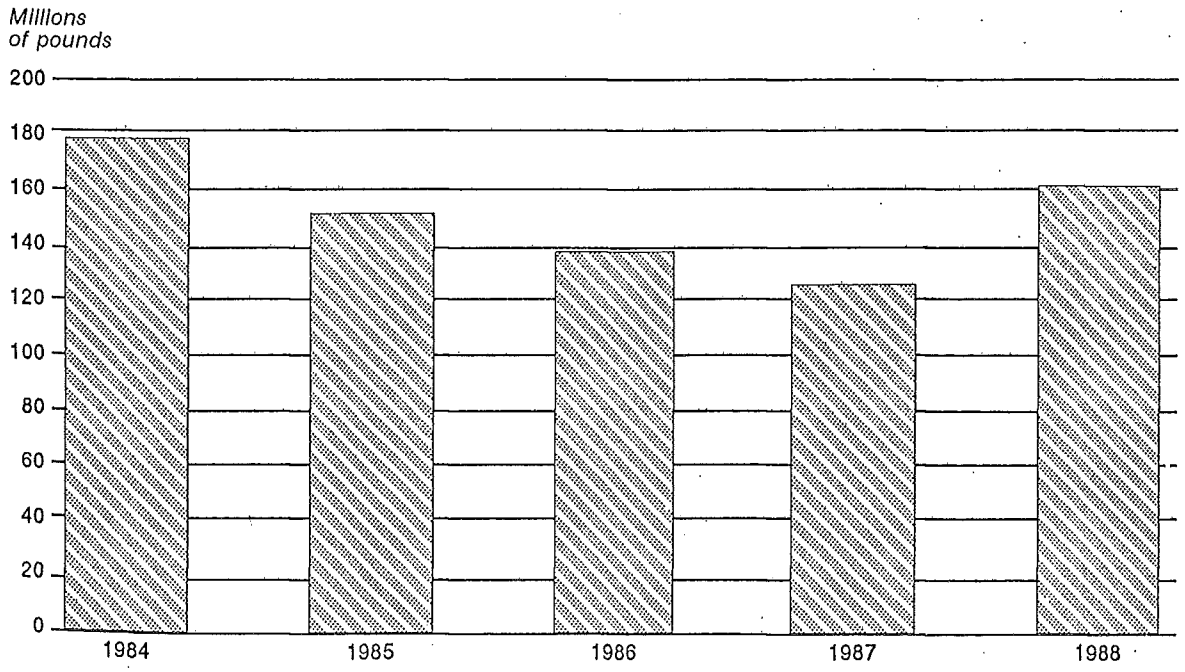
Production of cyclic flavor and perfume materials in 1988 amounted to 78.4 million pounds; sales amounted to 57.1 million pounds, valued at $704.3 million. Individual publishable chemicals in the cyclic group produced in the greatest volume in 1988 were anethole (3.0 million pounds), and eugenol (410 thousand pounds).

U.S. output of acyclic flavor and perfume materials in 1988 amounted to 83.7 million pounds; sales of these materials amounted to 37.9 million pounds, valued at $161.7 million. Individual publishable acyclic flavor and perfume chemicals produced in the greatest volume in 1988 were citronellol (2.1 million pounds) and tetrahydrogeraniol (1.1 million pounds).

Table 22 lists the products reported in this section and indicates the manufacturer(s) of each by code. These codes are identified by company name in table 23.

Eric Land
202-252-1349

Figure 8
Flavor and perfume materials: U.S. production, 1984-88



Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 21
Flavor and perfume materials: U.S. production and sales, 1988

Flavor and perfume materials	Production	Sales Quantity	Sales Value	Average Unit value[1]
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Grand total	162,086	94,980	866,095	$9.12
Cyclic				
Total	78,378	57,060	704,353	12.34
Benzenoid and Naphthalenoid				
Total	61,096	43,343	640,188	14.77
4-Allyl-2-methoxyphenol (Eugenol)	410	195	613	3.18
Benzyl propionate	23	(2)	(2)	(2)
Phenethyl isobutyrate	18	9	56	6.24
2-Phenethyl phenylacetate	36	18	125	6.79
p-Propenylanisole (Anethole)	3,035	2,970	10,948	3.69
All other benzenoid and naphthalenoid materials	57,574	40,151	628,446	15.65
Terpenoid, Heterocyclic, and Alicyclic				
Total	17,282	13,717	64,165	4.68
Cedryl acetate	177	110	645	5.85
Ionones	133	130	1,448	11.12
Methylionones	1,254	811	7,242	8.93
α-Terpineol	2,703	3,034	2,050	.68
Vetivenyl acetate	(2)	12	619	50.93
All other terpenoid, heterocyclic, and alicyclic materials	13,015	9,620	52,161	5.42
Acyclic				
Total	83,708	37,920	161,742	4.27
Citronellyl acetate	90	58	283	4.92
Citronellyl formate	29	17	150	8.85
3,7-Dimethyl-cis-2,6-octadienol, acetate (Neryl acetate)	22	21	130	6.21
3,7-Dimethyloctanol-1 (Tetrahydrogeraniol)	1,138	195	663	3.41
3,7-Dimethyl-6-octen-1-ol (Citronellol)	2,077	1,792	6,798	3.79
Ethyl hexanoate	31	21	107	5.08
Geranyl acetate	208	154	789	5.12
7-Hydroxy-3,7-dimethyl-1-octanal (Hydroxycitronellal)	138	(2)	(2)	(2)
Isopentyl butyrate	100	87	121	1.39
Isopentyl isovalerate	30	(2)	(2)	(2)
1,3-Nonanediol acetate	35	(2)	(2)	(2)
All other acyclic materials	79,810	35,575	152,701	4.29

[1] Calculated from unrounded figures.
[2] Reported data are accepted in confidence and may not be published, or no data were reported.
Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 22

Flavor and perfume materials for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Flavor and perfume materials	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 23)*
Cyclic		
Benzenoid and naphthalenoid:		
Acetaldehyde ethyl phenethyl acetal	No	IFF.
Acetaldehyde phenethyl propyl acetal	No	IFF.
2'-Acetonaphthone (β-Methyl naphthyl ketone)	No	GIV.
1-Acetoxy-2-sec-butyl-1-ethenylcyclohexane	No	GIV.
p-Allylanisole	No	SCM, ([2]), ([2]).
4-Allyl-1,2-dimethoxybenzene (4-Allylveratrole)	No	CI.
4-Allyl-2-methoxyphenol (Eugenol)	Yes	BDS, CI, ELN, FB, GIV, UNG.
4-Allyl-2-methoxyphenol acetate (Eugenol acetate)	No	GIV.
Amyl cinnamic aldehyde dimethyl acetal	No	FB.
Amyl cinnamyl acetate	No	IFF.
o-Anisaldehyde (o-Methoxybenzaldehyde)	No	FB.
p-Anisaldehyde	No	FB, GIV.
Anisyl acetate	No	ELN, GIV.
Aurantiol	No	BDS, FB.
Benzaldehyde glyceryl acetal	No	GIV.
Benzophenone	No	CWN, PD.
Benzyl acetate	No	FB.
Benzyl benzoate	No	KLM, MRF.
Benzyl butyrate	No	ELN, FB.
Benzyl cinnamate	No	FB.
Benzyl formate	No	FB.
Benzyl isobutyrate	No	ELN.
Benzyl isopentyl ether	No	GIV.
Benzyl isovalerate	No	ELN, FB.
1-(Benzyloxy)-2-methoxy-4-propenylbenzene (Benzyl isoeugenyl ether)	No	GIV.
Benzyl phenylacetate	No	ELN, GIV.
Benzyl propionate	Yes	ELN, FB, IFF.
Benzyl salicylate	No	FB.
p-tert-Butyl-α-methylhydrocinnamalehyde	No	GIV.
N-(3-(p-tert-butylphenyl)-2-methylpropylidene)-anthrantilic acid, methyl ester	No	GIV.
Carvacrol	No	GIV.
Cineole (eucalyptol)	No	SCM.
Cinnamaldehyde	No	FB.
Cinnamic aldehyde dimethyl acetal	No	CI.
Cinnamyl acetate	No	ELN, FB.
Cinnamyl alcohol	No	FB.
Cinnamyl butyrate	No	FB.
Cinnamyl cinnamate	No	FB.
Cinnamyl nitrile	No	IFF.
Cinnamyl propionate	No	ELN.
Coumarin	No	RDA.
Cuminyl acetate	No	IFF.
Cuminyl alcohol	No	GIV.
Cuminyl formate	No	IFF.
trans-Decahydro-β-naphthyl acetate	No	IFF.
2-4-Dibromo-6-nitro-m-cresyl methyl ether	No	GIV.
Dihydrocoumarin	No	ARS.
1,2-Dimethoxy-4-propenylbenzene (4- Propenylveratrole)	No	CI, FB.
β,4,Dimethyl-3-cyclohexene-1-propanal	No	CI.
γ,4-Dimethyl-3-cyclohexene-1-propanol	No	CI.
3,7-Dimethyl-1,6-octadien-3-yl formate	No	GIV.
3,7-Dimethyl-2,6-octadienyl phenylacetate (Geranyl phenylacetate)	No	GIV.
α,α-Dimethylphenethyl acetate	No	IFF.

See footnotes at end of table.

Table 22—Continued

Flavor and perfume materials for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Flavor and perfume materials	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 23)*
Cyclic—Continued		
Benzenoid and naphthalenoid—Continued		
Dimethyl phenylethyl carbinyl acetate	No	IFF.
N-(p-Ethoxycarbonylphenyl)-N'-ethyl-N'-phenylformamidine	No	GIV.
Ethyl anthranilate	No	FB, GIV.
Ethyl benzoate	No	ELN.
Ethyl cinnamate	No	ELN.
Ethyl-α,β-epoxy-β-methylhydrocinnamate	No	ELN.
2-Ethylhexyl-p-methoxy cinnamate	No	GIV.
2-Ethylhexyl salicylate	No	FB, FEL.
Ethyl phenylacetate	No	ELN.
Ethyl salicylate	No	FB.
Geranyl benzoate	No	GIV.
Heliotropyl acetate	No	IFF.
Heliotropyl acetone	No	AMB.
Hexahydro-5-methoxy-4,7-methano-1H-indene	No	CI.
cis-3-Hexenyl salicylate	No	BDS, IFF.
α-Hexylcinnamaldehyde	No	CI.
Hydratropaldehyde	No	IFF.
Hydratropaldehyde,dimethyl acetal	No	FB, GIV, IFF.
Hydrocinnamic acid	No	ELN.
Hydrocoumarin	No	ELN, GIV.
Hydroxycitronellal methyl anthranilate	No	GIV, IFF.
4-Hydroxy-3-ethoxybenzaldehyde (Ethylvanillin)	No	RDA.
4-Hydroxy-3-methoxybenzaldehyde (Vanillin)	No	RDA.
4-(4-Hydroxy-3-methoxyphenyl)-2-butanone (Vanillyacetone)	No	GIV.
p-Hydroxy phenylbutanone	No	GIV.
Isoamyl phenylacetate	No	ELN, FB.
Isobutyl phenylacetate	No	ELN, FB.
Isobutylquinoline	No	IFF.
Isobutyl salicylate	No	FB.
Isohexenyl tetrahydrobenzaldehyde (Myrac aldehyde)	No	IFF.
Isopentyl benzoate	No	GIV.
Isopentyl salicylate	No	FB.
l-Limonene	No	SCM.
Linalyl anthranilate	No	BDS.
Linalyl benzoate	No	GIV.
p-Mentha-1,8-diene (Limonene)	No	IFF.
Menthyl anthranilate	No	FB.
o-Methoxy benzaldehyde	No	CI.
p-Methoxybenzyl alcohol (Anisyl alcohol)	No	ELN, FB, GIV.
2-Methoxynaphthalene	No	GIV.
1-p-Methoxyphenyl penten-1-one-3 (α-Methyl-anisalacetone)	No	GIV.
3-(2-Methoxyphenyl)-2-propenal	No	CI.
2-Methoxy-4-propenylphenol (Isoeugenol)	No	CI.
2-Methoxy-4-propenylphenol, acetate	No	ELN.
2-Methoxy-4-propylphenol	No	CI.
4'-Methylacetophenone	No	CWN.
p-Methylanisole	No	GIV.
Methyl anthranilate	No	PSG.
β-Methylbenzene propanal	No	CI.
Methyl benzoate	No	KLM, MRF.
α-Methylbenzyl acetate (Styralyl acetate)	No	IFF.
α-Methylcinnamaldehyde	No	FB, IFF.
Methyl cinnamate	No	FB.
1,2-Methylenedioxy-4-propylene benzene (Isosafrole)	No	AMB.

See footnotes at end of table.

Table 22—Continued

Flavor and perfume materials for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Flavor and perfume materials	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 23)*
Cyclic—Continued		
Benzenoid and naphthalenoid—Continued		
p-Methylhydratropaldehyde	No	GIV.
1-Methyl-isohexyl-hexahydro benzaldehyde	No	GIV.
Methyl-N-methylanthranilate	No	AMB.
α-Methyl-3,4-methylene dioxyhydrocinnamaldehyde	No	GIV.
Methyl phenylacetate	No	ELN, GIV.
3-Methyl-5-phenyl-1-pentanol	No	IFF.
Methyl salicylate	No	KLM, MON.
Octahydro-5-methoxy-4,7-methano-1H-indene, 2-carboxaldehyde	No	CI.
α-Pentylcinnamaldehyde	No	CI, FB.
Phenethyl acetate	No	BDS, FB, IFF.
Phenethyl alcohol	No	FB, IFF.
Phenethyl formate	No	ELN, IFF.
Phenethyl isobutyrate	Yes	ELN, FB, GIV, IFF.
Phenethyl isovalerate	No	ELN, FB.
2-Phenethyl phenylacetate	Yes	BDS, ELN, FB, GIV, IFF.
Phenethyl propionate	No	ELN, IFF.
Phenethyl salicylate	No	GIV.
2-Phenoxyethyl isobutyrate	No	FB, IFF.
Phenoxyethyl propionate	No	FB.
Phenylacetaldehyde	No	CI, GIV.
Phenylacetaldehyde, dimethyl acetal	No	CI, ELN, GIV.
Phenylacetic acid	No	GIV.
Phenylacetic acid isopentyl ester	No	GIV.
α-Phenylanisole	No	GIV.
4-Phenyl-3-buten-2-one	No	FB.
Phenylethyl benzoate	No	IFF.
3-Phenyl-1-propanol (Hydrocinnamic alcohol)	No	FB.
3-Phenylpropyl acetate	No	ELN, FB, GIV.
3-Phenylpropyl cinnamate	No	FB.
Piperonal (Heliotropin)	No	AMB.
p-Propenylanisole (Anethole)	Yes	ARZ, FB, HPC, NCI, SCM.
p-Propylanisol (Dihydroanethole)	No	GIV.
Synthetic sweeteners:		
Cyclohexanesulfamic acid (Cyclamic acid)	No	ABB.
Cyclohexanesulfamic acid, sodium salt (Sodium cyclamate)	No	ABB.
Saccharin (1,2-Benzisothiazolin-3-one,-1, 1-dioxide)	No	PSG.
Saccharin,sodium salt	No	PSG.
All other synthetic sweetener material	No	NSW.
Tetramethyl octahydro acetophenone	No	IFF.
Tetramethyl octahydro acetyl naphthalene	No	IFF.
p-Tolualdehyde	No	GIV.
p-Tolylacetaldehyde	No	GIV.
p-Tolylacetate	No	ELN.
p-Tolylisobutyrate	No	IFF.
p-Tolyloctanoate	No	IFF.
p-Tolylphenylacetate	No	GIV.
α-(Trichloromethyl)benzyl acetate (Rosetone)	No	ARS.
Trimethyl benzyl dioxane	No	IFF.
Trimethylcyclohexyl salicylate	No	ARS.
Vanillin propylene glycol acetal	No	FB.
All other benzenoid or naphthalenoid chemicals	No	FB, IFF, TMH.
Terpenoid, heterocyclic, and alicyclic:		
Acetyl-n-butyryl (2,3-Hexanedione)	No	FB.
Acetyl cedrene (Vertoflex)	No	BDS.
Acetyl isovaleryl (5-Methyl-2,3-hexanedione)	No	FB.

See footnotes at end of table.

Table 22—Continued

Flavor and perfume materials for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Flavor and perfume materials	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 23)*
Cyclic—Continued		
Terpenoid, heterocyclic, and alicyclic—Continued		
N-Acetyl methyl anthranilate	No	AMB.
Acetyl propionyl (2,3-Pentanedione)	No	FB.
Allo-ocimene	No	SCM, ([2]), ([2]).
Allyl cyclohexyl propionate	No	GIV.
Amyl cyclohexyl acetate	No	IFF.
Amyris acetate	No	GIV.
Beta methyl ionone coeur	No	IFF.
2-tert-Butyl cyclohexanol	No	IFF.
2-sec-Butylcyclohexanone	No	GIV.
o-tert-Butylcyclohexyl acetate	No	CI, IFF.
p-tert-Butylcyclohexyl acetate (Verbenlax)	No	IFF.
Canrenoate, potassium salt	No	IFF.
l-Carvone	No	SCM.
β-Caryophyllene	No	BDS, FB, GIV.
α-Cedrene epoxide(Andrane)	No	BDS, IFF.
Cedrenol	No	ELN, IFF.
Cedrol	No	ELN.
Cedryl acetate	Yes	BDS, ELN, IFF.
Cedryl formate	No	IFF.
Cyclohexyl salicylate	No	FB.
Cyclopentanone	No	FB.
Dihydronordicyclopentadienyl acetate (Cyclacet)	No	BDS, CI.
Dihydronordicyclopentadienyl propionate (Cyclaprop) (Verdyl propionate extra)	No	BDS, CI.
Dihydro terpineol	No	IFF, NCI, SCM.
2, 6-Dimethylheptan-2-ol	No	GIV.
Ethyl furoate	No	IFF, SCM.
4-Ethyl guaiacol	No	STG.
Galaxolide (1,3,4,6,7,8-Hexahydro-4,6,6,7,8,8-hexamethyl-cyclopenta-2-benzopyran)	No	IFF.
Guaiacwood acetate	No	ELN, FB.
Guaiene	No	FB.
2-Heptylcyclopentanone	No	IFF.
Hexadecanolide	No	IFF.
3-Hydroxy-2-ethyl-4-pyrone (Ethylmaltol)	No	PFZ.
4-(4-Hydroxy-4-methyl pentyl)-3-cyclohexene-10-carboxaldehyde (Lyral)	No	IFF.
3-Hydroxy-2-methyl-4-pyrone (Maltol)	No	PFZ.
4-Hydroxynonanic acid, γ-lactone (γ-Nonalactone)	No	ELN.
4-Hydroxyundecanoic acid, γ-lactone (γ-Undecalactone)	No	ELN.
Ionone(α- and β-)	No	GIV, NCI.
α-Ionone	No	BDS, GIV, IFF.
β-Ionone	No	BDS, IFF.
Isobornyl acetate	No	SCM.
Isobornyl methyl ether	No	SCM.
Isobornyl propionate	No	ELN.
Isojasmone	No	FB.
Isolongifolene epoxide	No	GIV.
Isomenthone	No	GIV.
2-Isopropylcyclohexanol	No	GIV.
6-Isopropyldecalone	No	GIV.
Isopulegyl acetate	No	GIV.
p-Mentha-1,3-diene (α-Terpinene)	No	SCM.
p-Mentha-1,4-diene (γ-Terpinene)	No	SCM.
p-Mentha-6,8-dien-α-ol (Carveol)	No	FB.
p-Mentha-6,8-dien-α-one (Carvone, Carvol)	No	FB.

See footnotes at end of table.

Table 22—Continued

Flavor and perfume materials for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Flavor and perfume materials	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 23)*
Cyclic—Continued		
Terpenoid, heterocyclic, and alicyclic—Continued		
1-p-Mentha-6,8-dien-2-yl acetate (Carvyl acetate)	No	FB.
p-Menth-8-en-3-ol (Isopulegol)	No	GIV.
p-Menth-1-en-3-one (Piperitone)	No	GIV.
p-Menth-4-(8)-en-3-one (Pulegone)	No	GIV.
1-1-p-Menthen-6-yl-1-propanone	No	GIV.
d,l-Menthol, synthetic	No	GIV, HAR, IFF, SCM.
l-Menthol, synthetic	No	HAR.
Menthyl acetate	No	GIV.
l-Menthyl acetate	No	SCM.
α-Methylcyclohexanemethanol	No	CI.
Methylionone (α- and β-)	No	BDS, GIV, IFF.
γ-Methylionone	No	GIV, IFF.
6-Methyl-α-ionone	No	BDS, FB, GIV.
Nopol	No	IFF, NCI.
Nopyl acetate	No	IFF.
para-Cymene	No	SCM.
1-Phenysal-1,2-propanidione	No	STG.
Pinyl acetate	No	SCM.
Propyl furylacrylate	No	AMB.
Rose oxide	No	FB.
α-Santalyl acetate	No	GIV.
Terpinene-ol	No	SCM.
α-Terpineol	Yes	HPC, IFF, SCM.
α-Terpinyl acetate	No	IFF, SCM.
α-Terpinyl propionate	No	ELN.
3,3,5-Trimethyl cyclohexanol (m-Homomenthol)	No	ARS.
Trimethyl cyclohexenyl butenone	No	IFF.
1-(2,6,6-Trimethyl-2-cyclohexen-1-yl)-1, 6-heptadien-3-one (Allyl-α-ionone)	No	IFF.
Trimethyl norbornane methanol	No	IFF.
α,α,5-Trimethyl-5-vinyl-furfuryl alcohol and tetrahydro-2,2,6-trimethyl-6-vinyl-3-ol	No	GIV.
5-(2,2,3-Trimethylcyclopent-3-en-1-yl)-3-methylpentan-2-ol	No	GIV.
Vetivenol	No	GIV.
Vetivenyl acetate	Yes	BDS, ELN, GIV.
All other terpenoid, hetercyclic, or alicyclic flavor and perfume chemicals	No	CI, GPI, IFF, SCM, STG.
Acyclic:		
Allyl disulfide	No	IFF.
Allyl heptanoate	No	ELN, FB.
Allyl hexanoate	No	ELN, FB.
Ammonium isovalerate	No	RSA.
Butanoic acid, 1-cyclohexylethyl ester	No	CI.
Butyl butyrate	No	AMB.
Butyl butyrl lactate	No	ELN, FB.
Butyl undecylenate	No	FB.
Butyraldehyde diethyl acetal	No	FB.
Citral dimethyl acetal	No	IFF.
Citronellyl acetate	Yes	BDS, ELN, FB, GIV, IFF, SCM.
Citronellyl formate	Yes	BDS, ELN, GIV, IFF.
Citronellyl isobutyrate	No	ELN, GIV, IFF.
Citronellyl propionate	No	IFF.
Crude acetate mixture (Linalyl, neryl, geranyy acetates main components)	No	([2]).

See footnotes at end of table.

Table 22—Continued

Flavor and perfume materials for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Flavor and perfume materials	Separate statistics[1]	Manufacturers' identification codes (according to list in table 23)
Acyclic—Continued		
Decanal (Capraldehyde)	No	CI.
Decyl acetate	No	GIV.
Diethyl sebacate	No	ELN.
Diethyl succinate	No	MRF.
Dihexyl fumarate	No	FB.
Dihydrocarvone	No	SCM.
Dihydrolinalool	No	SCM.
Dihydromyrcenol	No	SCM, ([2]), ([2]).
Dihydro pentamethyl indanone	No	IFF.
Dihydroterpinyl acetate	No	IFF, NCI.
1,1-Dimethoxy octane	No	IFF.
4-(1,1-Dimethylethyl)cyclohexanol	No	CI.
2,6 Dimethyl-5-hepten-1-al	No	GIV.
Dimethyl hexanediol	No	([2]).
2,5-Dimethyl-3-hexyne-2,5-diol	No	([2]).
3,7-Dimethyl-trans-2,6-octadienal (Citral A, Geranial)	No	BDS.
3,7-Dimethyl-2,6-octadienal (Citral a & b)	No	NCI, SCM.
3,7-Dimethyl-2,6-octadienenitrile	No	CI.
3,7-Dimethyl-2,6-octadiene oxime	No	CI.
3,7-Dimethyl-cis-2,6-octadien-1-ol (Nerol)	No	ELN, FB, GIV, NCI, SCM.
3,7-Dimethyl-trans-2,6-octadien-1-ol (Geraniol)	No	ELN, FEL, GIV, IFF, NCI, SCM.
3,7-Dimethyl-1,6-octadien-3-ol (Linalool) (Linalyl alcohol)	No	IFF, SCM.
3,7-Dimethyl-cis-2,6-octadienol, acetate (Neryl acetate)	Yes	ELN, GIV, SCM.
3,7-Dimethyl-1,6-octadien-3-ol, acetate (Linalyl acetate	No	GIV, SCM.
3,7-Dimethyl-1,6-octadien-3-yl isobutyrate (Linalyl isobutyrate)	No	GIV.
3,7-Dimethyl-1,6-octadien-3-yl propionate (Linalyl propionate)	No	GIV.
Dimethyloctanal	No	GIV, SCM.
3,7-Dimethyloctanol-1 (Tetrahydrogeraniol)	Yes	GIV, IFF, NCI, SCM.
3,7-Dimethyl-3-octanol	No	FB, SCM.
Dimethyloctanyl acetate	No	GIV, IFF.
3,7-Dimethyl-6-octen-1-al (Citronellal)	No	GIV, SCM.
3,7-Dimethyl-6-octenenitrile	No	CI.
3,7-Dimethyl-6-octene oxime	No	CI.
3,7-Dimethyl-6-octen-1-ol (Citronellol)	Yes	ELN, FB, GIV, IFF, NCI, SCM.
3,7-Dimethyl-7-octenol 70%, 6-octenol isomer 30%	No	GIV.
Dimethyl succinate	No	FB.
Dodecane nitrile	No	IFF.
Ethyl butyrate	No	FB, HPC, NW.
Ethyl caprate	No	FB.
Ethyl formate	No	FB.
Ethyl heptanoate	No	ELN, FB, FEL.
Ethyl hexanoate	Yes	ELN, FB, NW.
Ethyl isobutyrate	No	FB.
Ethyl isovalerate	No	ELN.
Ethyl laurate	No	ELN, FB.
Ethyl-2-methyl butyrate	No	FB.
Ethyl-2 methyl pentanoate	No	HPC.
Ethyl myristate	No	ELN.
Ethyl nonanoate	No	FB.
Ethyl octanoate	No	FB.
Ethyl propionate	No	FB, MRF, NW.
Ethyl trimethyl cyclopentenyl buterol	No	IFF.
Ethyl valerate	No	ELN.
Geranyl acetate	Yes	BDS, CI, ELN, FB, FEL, GIV, IFF, NCI, SCM.

See footnotes at end of table.

Table 22—Continued

Flavor and perfume materials for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Flavor and perfume materials	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 23)*
Acyclic—Continued		
Geranyl butyrate	No	BDS, ELN, GIV.
Geranyl crotonate	No	FB.
Geranyl ethyl ether	No	IFF.
Geranyl formate	No	ELN, GIV.
Geranyl isobutyrate	No	IFF.
Geranyl isovalerate	No	FB.
Geranyl nitrile (Citralva)	No	IFF.
Geranyl propionate	No	FB.
Geranyl tiglate	No	FB.
Heptanolide	No	FB.
N-Hexanal	No	CI.
2-Hexenal	No	FB, GIV.
2-Hexenol	No	FB.
cis-3-Hexen-1-yl acetate	No	BDS, GIV, IFF.
cis-3-Hexenyl butyrate	No	IFF, SCM.
cis-3-Hexenyl methyl carbonate	No	IFF.
cis-3-Hexenyl tiglate	No	BDS.
Hexoxyacetaldehyde dimethyl acetal	No	FB.
Hexyl acetate	No	FB.
Hexyl caproate	No	FB.
Hexyl 2-methylbutyrate	No	SCM.
Hydroxycitronellol	No	SCM.
7-Hydroxy-3,7-dimethyl-1-octanal (Hydroxycitronellal)	Yes	GIV, IFF, SCM.
7-Hydroxy-3,7-dimethyl octanal, dimethyl acetal (Hydroxycitronellal, dimethyl acetal)	No	GIV.
Hydroxy-2-propanone (Acetol)	No	FB.
Isoamyl caproate	No	FB.
Isoamyl caprylate	No	FB.
Isoamyl propionate	No	FB.
Isobutyl acetate	No	FB, NW.
Isobutyl-2-butenoate	No	AMB.
Isobutyl butyrate	No	FB.
Isopentyl acetate (Isoamyl acetate)	No	ELN, FB.
Isopentyl butyrate	Yes	FB, GIV, NW.
Isopentyl formate	No	ELN, FB.
Isopentyl isovalerate	Yes	ELN, FB, HPC.
Lauraldehyde	No	GIV, SCM.
3-Methyl-2-butenyl acetate	No	IFF.
3-Methyl butyl butyrate	No	FB.
2-Methylbutyl isovalerate	No	SCM.
Methyl butynol	No	([2]).
2-Methyldecanal	No	CI.
2-Methylene undecanal	No	CI.
Methyl hexyl ether	No	SCM.
Methyl isobutyrate	No	HPC.
Methyl isovalerate	No	FB.
Methyl-2-methyl butyrate	No	SCM.
3-Methyl-2-[and 3]nonene nitrile	No	GIV.
Methylol methyl hexyl ketone	No	GIV.
Methyl pentynol	No	([2]).
Methyl propionate	No	FB.
2-Methylundecanal	No	CI, GIV.
Myrcenyl acetate	No	IFF.
Myristaldehyde	No	GIV.
Nonanal	No	CI.
1,3-Nonanediol acetate	Yes	ELN, GIV, SBC.
Nonanol	No	GIV.

See footnotes at end of table.

Table 22—Continued

Flavor and perfume materials for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Flavor and perfume materials	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 23)*
Acyclic—Continued		
Ocimene	No	IFF.
Ocimenyl acetate	No	IFF.
Octanal	No	CI.
3-Octanone (Ethyl amyl ketone)	No	GIV.
N-Octyl acetate	No	FB, SCM.
Octyl formate	No	FB.
Octyl isobutyrate	No	FB.
Octyl isovalerate	No	GIV.
Pseudo linalyl acetate (Neobergamate)	No	IFF.
Rhodinol	No	GIV, IFF.
Tepyl acetate	No	ELN.
Tetrahydro-allocimerol (50/50 mixture of tetrahydro-linalool and tetrahydro-myrcenol)	No	([2]).
Tetrahydromyrcenol	No	SCM.
Trimethyl-cyclododeca-trienyl ethanone	No	IFF.
3,5,5-Trimethyl hexanal	No	IFF.
Undecanal	No	CI, GIV.
9-Undecenal	No	GIV.
All other acyclic flavor and perfume materials	No	FB, IFF, SCM, SK, ([2]).

[1] Chemicals for which seperate statistics1 are reported in this section are indicated by 'Yes.' Chemicals for which data are accepted in confidence and may not be published are indicated by 'No.'
[2] The manufacturer did not consent to his identification with the disignated products.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 23
Flavor and perfume materials: Directory of manufacturers, alphabetical by code, 1988

Code	*Name of company*	*Code*	*Name of company*
ABB	Abbott Laboratories	NCI	Union Camp Corp., Terpene and Aromatics Div.
AMB	American Bio-Synthetics Corp.	NSW	Nutrasweet Co.
ARS	Arsynco, Inc.	NW	Northwestern Chemical Co.
ARZ	Arizona Chemical Co.	PD	Parke-Davis, Div. of Warner-Lambert Co.
BDS	Fragrance Resources, Inc.	PFZ	Pfizer, Inc.
CI	Firmenich, Inc.	PSG	PMC Specialities Group, Inc.
CWN	Upjohn Co., Fine Chemical	RDA	Rhone-Poulenc, Inc.
ELN	Elan Chemical Co.	RSA	RSA Corp.
FB	Fritzsche Dodge & Olcott, Inc.	SBC	Scher Chemicals, Inc.
FEL	Felton International, Inc.	SCM	SCM Glidco Organics
GIV	Givaudan Corp.	SK	Smithkline Chemicals
GPI	Grindsted Products, Inc.	STG	McCormick & Co., Inc. McCormick-Stange Flavor Div.
HAR	Haarmann & Reimer Corp.	TMH	Harcros Chemicals, Inc.
HPC	Hercules, Inc.	UNG	Ungerer & Co.
IFF	International Flavors & Fragrances, Inc.		
KLM	Kalama Chemical, Inc.		
MON	Monsanto Co.		
MRF	Morflex Chemical Co., Inc.		

Note.—Complete names, telephone numbers, and addresses of the above reporting companies are listed in app. A.
Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Section 8

Plastic and Resin Materials

Plastics and resin materials are high molecular weight polymers which, at some stage in their manufacture, exist in such physical condition that they can be shaped or otherwise processed by the application of heat and pressure. The terms "plastics," "resin," and "polymers," can be (and often are) used interchangeably by the trade. Depending on the chemical composition, manufacturing process, or intended use, the commercial products may contain plasticizers, fillers, extenders, stabilizers, coloring agents, or other additives. There are about 40 to 50 basic plastics and resins which are available commercially. These basic materials are available in literally thousands of individual compounds each with its distinct properties depending on the molecular weight of the resin and the types and amounts of the additives present. Plastics materials may be molded, cast, or extruded into semifinished or finished solid forms. Resin materials may be in the form of solutions, pastes, or emulsions for applications such as protective coatings, adhesives, or paper and textile treatment.

Statistics on U.S. production and sales of synthetic plastics and resin materials for 1988 are given in table 24. U.S. production of plastics and resin materials in 1988 totaled 63,536 million pounds, or 6.8 percent more than the 59,481 million pounds produced in 1987. From 1984–88, the production of plastics and resin materials increased steadily from 48,255 million pounds in 1984 to 63,536 million pounds in 1988, or at an average, annual rate of growth of 7.1 percent (see figure 9). Sales in 1988 totaled 55,240 million pounds, valued at $33,831 million, compared with 51,170 million pounds, valued at $26,068 million, in 1987.

Thermosetting materials are those which harden with a change in composition in the final treatment so that in their final state as finished articles they are substantially infusible and insoluble; that is, they cannot again be softened by heat or solvents. U.S. production of thermosetting materials totaled 9,593 million pounds in 1988, compared with 8,923 million pounds in 1987. Production of the most important products in 1987 included phenolic (1,687 million pounds), amino (urea and melamine) resins (2,755 million pounds), polyester resins, unsaturated (1,477 million pounds), and alkyd resins (760 million pounds).

Thermoplastic materials are those which in their final state as finished articles can be repeatedly softened by heat and hardened by a decrease in temperature. U.S. production of thermoplastic materials totaled 53,942 million pounds in 1988 (or 84.9 percent of the total plastics and resin materials output for 1988), compared with 50,558 million pounds in 1987. Production of the most important products in 1988 included polyethylene (19,357 million pounds), polypropylene (7,257 million pounds), vinyl resins (10,357 million pounds), and styrene type materials (9,185 million pounds). In 1988, production of saturated polyester resins reached 2,760 million pounds (polyethylene terephthalate alone reached 2,110 million pounds). Production of engineering plastics, in the aggregate, amounted to 1,491 million pounds in 1988.

Table 25 lists the products reported in this section and indicates the manufacturer(s) of each by code. These codes are identified by company name in table 26.

Edward J. Taylor
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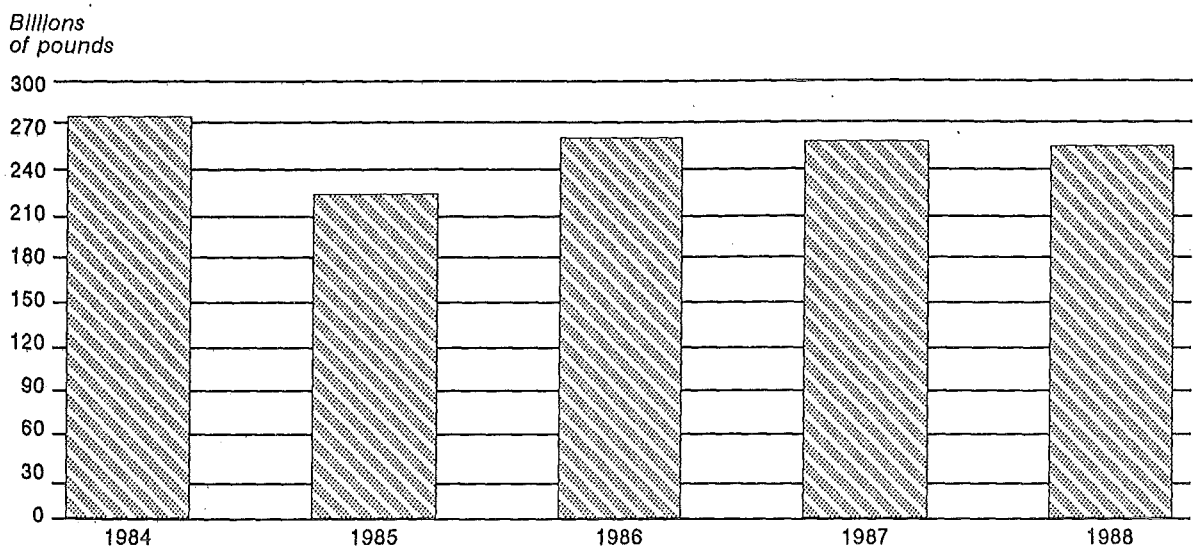
Figure 9
Plastics and resin materials: U.S. production, 1984-88



Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 24
Plastics and resin materials: U.S. Production and sales, 1988

Plastics and resin materials	Production	Sales Quantity	Sales Value	Average Unit value[1]
	1,000 pounds dry basis[2]	1,000 pounds dry basis[2]	1,000 dollars	Per pound
Grand total	63,536,140	55,240,240	33,831,291	$0.61
Thermosetting resins				
Total	9,593,400	7,909,139	4,079,722	.52
Alkyd resins, total	760,216	505,123	297,306	.59
Phthalic anhydride type	614,653	441,584	246,197	.56
Polybasic acid type	32,652	16,263	12,674	.78
Styrenated-alkyds or copolymer alkyds	18,971	8,630	7,284	.84
Vinyl toluene alkyds	29,038	25,992	19,206	.74
All other alkyd resins	64,902	12,654	11,945	.94
Dicyandiamide resins (an amino resin)	1,977	2,314	2,670	1.15
Epoxy resins:[3 4]				
Unmodified	567,178	419,461	434,777	1.02
Advanced	(376,328)	(270,669)	(364,612)	(1.35)
Furfuryl type resins	19,240	19,171	12,916	.67
Glyoxal-formaldehyde resins	15,431	11,360	12,683	1.12
Melamine-formaldehyde resins (an amino resin)	252,628	214,052	192,428	.90
Phenolic and other tar acid resins	1,687,318	1,163,568	673,490	.58
Polyester resins, unsaturated[5]	1,477,027	1,408,600	841,736	.60
Polyether and polyester polyols for urethanes[6]	1,872,193	1,627,468	893,624	.55
Polyurethane elastomers and plastics products, total	273,029	204,072	324,168	1.59
Elastomers[7]	112,774	101,662	201,222	1.98
Plastics	160,255	102,410	122,946	1.20
Urea-formaldehyde resins (an amino resin)[8]	2,501,953	2,193,507	249,767	.11
All other thermosetting resins[9]	165,210	140,443	144,157	1.03
Thermoplastic resins				
Total	53,942,740	47,331,101	29,751,569	.63
Acrylic resins, total[10]	1,649,859	1,289,360	1,501,833	1.16
Homopolymer resins, except PMMA, of acrylic or methacrylic acid esters	43,953	34,479	39,679	1.15
Polymethyl methacrylate (PMMA) resins	651,522	400,871	419,327	1.05
Thermosetting acrylic resins	119,695	43,034	48,949	1.14
All other acrylic resins	834,689	810,976	993,878	1.23
Engineering plastics[11]	1,491,228	1,219,247	2,285,564	1.87
Petroleum hydrocarbons resins	384,036	346,896	161,470	.47
Polyamide resins, total	655,642	582,935	840,279	1.44
Nylon type[10 12]	581,061	537,068	802,367	1.49
Non-nylon type	74,581	45,867	37,912	.83
Polyester resins, saturated, total[10 13]	2,759,815	1,913,285	1,716,202	.90
Polyethylene terephthalate (PET)	2,110,103	1,379,788	1,025,663	.74
All other saturated polyesters, including Polybutylene terephthalate, (PBT) resins	649,712	533,497	690,539	1.29

See footnotes at end of table.

Table 24

Plastics and resin materials: U.S. Production and sales, 1988

Plastics and resin materials	*Production*	*Sales*		*Average Unit value*[1]
		Quantity	*Value*	
	1,000 pounds dry basis[2]	*1,000 pounds dry basis*[2]	*1,000 dollars*	*Per pound*
Thermoplastics resins—Continued				
Polyethylene resins, total	19,357,246	18,282,719	8,905,951	$0.49
Ethylene-vinyl acetate and other copolymer resins	662,919	587,858	360,541	.61
Specific gravity 0.940 and below, total[14]	9,779,232	9,013,356	4,461,044	.49
Low density polyethylene (LDPE) resins	8,197,576	7,623,580	3,818,093	.50
Linear low density polyethylene (LLDPE) resins	1,581,656	1,389,776	642,951	.46
Specific gravity over 0.940	8,915,095	8,681,505	4,084,366	.47
Polypropylene resins	7,256,768	5,896,665	2,819,374	.48
Polyterpene resins	56,427	49,965	41,007	.82
Polytetrafluoroethylene (PTFE) resins	18,095	24,604	141,645	5.76
Rosin modifications, total	325,092	286,419	157,050	.55
Modified rosin (unesterified)	167,196	135,166	49,517	.37
Modified rosin esters	118,612	112,554	83,822	.74
Rosin esters, unmodified (Ester gums)	39,284	38,699	23,711	.61
Styrene plastics materials, total	9,184,926	7,808,080	6,083,103	.78
Acrylonitrile-butadiene-styrene terpolymer (ABS) resins	1,929,284	1,860,178	1,713,025	.92
Methyl methacrylate-butadiene-styrene (MBS) resins and certain other styrene type plastics materials	52,299	43,538	55,739	1.28
Polystyrene homopolymers, total	5,797,121	4,761,269	2,882,349	.61
Expandable polystyrene beads	551,150	554,640	370,750	.67
Rubber modified polystyrene	2,057,410	1,962,063	1,214,680	.62
Straight polystyrene	3,188,561	2,244,566	1,296,919	.58
Sytrene latexes, total	780,527	754,217	477,322	.63
Styrene-butadiene latexes	561,135	534,398	337,567	.63
All other styrene latexes	219,392	219,819	139,755	.64
All other styrene plastics materials[15]	625,695	388,878	954,668	2.45
Vinyl resins, total[16]	10,357,030	9,349,567	4,524,914	.48
Polyvinyl acetate[17]	675,099	650,203	355,506	.55
Polyvinyl chloride and copolymers	8,588,205	7,798,405	3,224,604	.41
Polyvinylidene chloride resins, latex type	24,998	20,698	18,695	.90
Vinyl acetate-acrylate copolymers	521,443	497,294	214,296	.43
All other vinyl and vinylidene resins[18]	547,285	382,967	711,813	1.86
All other thermoplastic resins[19]	446,576	281,359	573,177	2.04

[1] Calculated from unrounded figures.
[2] Dry weight basis unless otherwise specified. Dry weight basis is the total weight of the materials including resin and coloring agents, extenders, fillers, plasticizers, and other additives, but excluding water and other liquid diluents unless they are an integral part of the materials.
[3] Includes reactive diluents which are an integral part of the resin. Excludes the weight of hardeners sold in association with the resin as part of a two-component system.
[4] Data shown for advanced epoxy resins are that part of the unmodified epoxy resins which is further processed; therefore, the total in parentheses are not included in the grand total.
[5] Polyester resins are unsaturated alkyd resins, later to be copolymerized with a monomer (Such as styrene or methyl methacrylate), and polyallyl resins (such as diallyl phthalate and diglycol carbonate). Data are on an "as sold" basis, including monomer if part of the resin system.
[6] In addition to the polyols, the other principal starting materials used in the production of urethane products are the isocyanic acid derivatives, mainly the 80/20 mixture of toluene-2,4- and 2,6-diisocyanate.
Statistics for the isocyanic acid derivatives are reported in the "Cyclic Intermediates" section of the Synthetic Organic Chemicals report.

Footnotes for table 24—Continued

[7] The data on urethane elastomers are believed to be not fully representative of the total urethane market in view of the very large number of urethane elastomer producers. The commission has begun reporting statistics for urethane elastomers in two sections, section VIII, plastics and resin materials, and section X, elastomers (synthetic rubber). Henceforth those polyurethane products classified as "thermoplastic" urethane elastomers will be reported in SOC section X; all other urethane elastomers will remain in SOC section VIII.
[8] Includes thiourea resins.
[9] Includes acetone-formaldehyde resins, polybutadiene resins, silicone resins, and certain other thermosetting resins.
[10] Does not include production or sales for fiber use.
[11] Engineering plastics: Includes acetal, polycarbonate, polyimide and amide-imide polymers, polyphenylene oxide, polyphenylene sulfide and polysulfone. Engineering plastics are defined in *Whittington's Dictionary of Plastics*, as "All plastics, with or without fillers or reinforcements, which have mechanical, chemical and thermal properties suitable for use in construction, machine components and chemical processing equipment." The above list of plastics (all of which are thermoplastic) was selected from a larger group in this source. Certain other plastics named in Whittington's Dictionary as engineering plastics, such as ABS resins, acrylic resins, and nylon resins, are not included in the above list as they are published separately.
[12] Statistics for nylon 6 and nylon 6/6 which are used in plastics applications (e.g., molding, etc.) are included here.
[13] Statistics are included here for polyethylene terephthalate used in plastics applications (e.g., molding, etc.) Statistics also are included here for production only when the starting materials are converted directly to a finished product(i.e., "in situ" production); polyester film and tape are examples of such a conversion.
[14] Data shown for LLDPE resins are incomplete because several of the leading producers of LLDPE still continue to aggregate these data with that of LDPE.
[15] Includes data for a-methyl styrene polymers, styrene acrylonitrile (SAN) copolymer resins, styrene-allyl alcohol copolymer resins, styrene-divinylbenzene copolymer resins, styrene-maleic anhydride copolymers resins and styrene-methyl methacrylate copolymers resins, and other styrene resins.
[16] Data are on the basis of dry resin content, excluding the weight of plasticizers, extenders, fillers coloring agents, stabilizers, or impact modifiers, unless otherwise noted.
[17] Data for polyvinyl acetate produced and sold in latex form includes the weight of any protective colloids which are used as emulsion stabilizers and form an integral part of the resin system. Production and sales do not include polyvinyl acetate used as a reactive intermediate for polyvinyl alcohol or other vinyl resins.
[18] Includes polyvinyl alcohol, polyvinyl butyral, polyvinyl formal, polyvinylidene chloride (solid type), and other vinyl resins.
[19] Includes cellulose plastics, coumarone-indene resins, fluorocarbon resins, (except PTFE), phenoxy resins, polybutylene type resins, polyphenyl aromatic ester resins, and certain other thermoplastic materials.

Note.—Data reported to the U.S. International Trade Commission do not necessarily coincide with that reported to the Society of the Plastics Industry (SPI) because of differences in both the reporting instrucions and in the coverage of certain resins.

Source: Compiled from data received in response to questionnaires of the U.S International Trade Commission.

Table 25

Plastics and resin materials for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Plastics and resin materials	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 26)*
Thermosetting resins:		
Acetone-formaldehyde resins	No	ACY, FJI, FLH, GP.
Alkyd resins:	Yes	
Acrylate-alkyd copolymer resins	No	CPV, DRR, FJI, FRE, GLD, JOB, MNP, OBC, PPG, REL, SW.
Alkoyl phenol	No	(2).
Phthalic anhydride type alkyd resins	Yes	ACO, ACY, ASH, BAL, BLC, BRU, CCC, CGL, CJO, CPV, DRC, DSO, DUP, EW, FOC, FRE, GGI, GLD, GRG, GRV, HAN, HIL, ICF, JOB, JSC, LIC, MCC, MNP, NCP, NTL, OBC, PER, PPG, PRT, QCP, RCI, REL, REZ, SRY, SW, TNA, UNO, (2), (2), (2).
Polybasic acid type alkyd resins	Yes	ACY, CJO, CPV, DSO, FOC, GGI, GLD, HAN, ICF, IOV, JOB, MCC, NTL, OBC, PPG, RCI, REL, SCN, SW.
Styrenated-alkyds, or copolymer alkyds	Yes	BLC, CJO, CPV, DSO, EW, FRE, GGI, GLD, MNP, MRT, NTL, OBC, REL, RUO, SW.
Vinyl toluene alkyds	Yes	BLC, CGL, CJO, CPV, FJI, FRE, GGI, GLD, JOB, MCC, MNP, PRT, SW.
All other alkyd copolymers	No	CGL, CJO, MCC, MNP, OBC, REL, SW, (2), (2).
Amino resins:		
Melamine-formaldehyde resins	Yes	AUX, BOR, CBD, CGL, CPV, DGO, GRG, HCL, JSC, MNP, MON, OCF, PLS, PMC, PPG, PPL, PST, RCI, REL, REZ, SQA, UTC, WRD.
Thiourea resins	No	CMP.
Urea-formaldehyde resins	Yes	ACR, ACY, AIP, AUX, BOR, CBD, CGL, CMP, CPV, DAN, DSO, GP, GRV, JSC, MMM, PMC, PST, REL, REZ, SAC, SOR, SQA, WPG.
Dicyandiamide resins	Yes	CMP, ECC, HCL, JSC, S, SQA, UTC.
Epoxy resins:		
Epoxy,resins advanced	Yes	ASL, CGL, CGY, CJO, CNI, CPV, DOW, DSO, DUP, EW, GE, GLD, GRG, GRV, HAN, HXL, ICF, MCC, MID, MNP, MRT, OCF, PPG, QUN, RCI, REZ, SCN, SMO, WLN.
Epoxy, resins unmodified	Yes	AGI, ASH, CGY, CLU, DOW, JOB, PRT, RCI, REZ, SHC, UCC, (2)
Furfuryl type resins	Yes	ACR, CLU, DRR, HVG, UNO, WRD.
Glyoxal-formaldehyde resins	Yes	AIP, AUX, CMP, HCL, RBI, RTC, SQA.
Phenolic and other tar acid resins	Yes	ACR, ACY, ADC, ASH, BME, BOR, BSC, BTL, BUC, CBD, CLU, CPV, DRR, DSO, EW, GE, GGI, GP, HCL, HER, HKD, HPC, HVG, ICF, IRI, KPT, LII, MCA, MID, MMM, NCI, NTC, NTL, OBC, OCF, PLS, PPL, PSG, RCI, SPL, SW, UCC, UNO, USR, VSV, WCA, WRD, (2), (2), (2)
Polybutadiene resins	No	CCS, CNI, CRS, LC, PSL, SCN.
Polyester resins, unsaturated, and allyl resins:	Yes	
Allyl resins	No	CMC, FMC, MCC.
Diallyl isophthalate	No	CMC, FMC.
Polyester resins, unsaturated	No	ACR, ACY, ADC, APH, ART, ASH, CGL, CPV, DSO, EW, FJI, FRE, GLD, GRG, ICF, ICI, IPC, KPT, LII, MCC, MRT, NCP, OCF, PPG, PPL, RCI, SHX, SIC, SLC.

See footnotes at end of table.

Table 25—Continued

Plastics and resin materials for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Plastics and resin materials	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 26)*
Thermosetting resins—Continued		
Polyether and polyester polyols for urethanes	Yes	ARK, BAS, BMC, BPT, CHC, CXI, DOW, DSO, FRE, GRG, JOB, MCC, MOB, MRT, NTL, OCF, OMC, PPG, RCI, RUO, UCC, WM.
Polyurethane elastomer and plastic products:		
Polyurethane elastomers	Yes	ACY, ADC, ARO, BAS, BPT, CAS, CGY, CNI, DCC, DNS, EPI, GLC, GRD, HXL, HYA, INP, MRT, PLN, PPG, PRC, RUO, SBG, SLC, SMO, USM, USR.
Polyurethane resins	Yes	ARO, CGL, DSO, DUP, EW, FRE, GGI, GLD, HYC, INP, LC, MCC, MID, MOB, OMC, PEL, RBI, SCN, SHX, SIF, SW.
Silicone resins	No	CJO, DCC, MCC, PEL, SPD.
All other thermosetting resins	Yes	
Thermoplastic resins:		
Acrylic resins:	Yes	
Copolymer resins of acrylic and/or methacrylic acid resins:		
Butyl acrylate ethyl acrylate copolymer resins	No	AIP, BFG, DSO, ICI, RH, UOC.
Butyl methacrylate-ethyl methylacrylate copolymer resins	No	UOC.
2-Ethylhexyl acrylate-methy acrylate copolymer resins	No	AIP, RH, UOC.
Lauryl methacrylate-stearyl methacrylate copolymer resins	No	ICI.
Other copolymer resins of acrylic and/or methacrylic acid esters	No	ACO, AIP, BPT, CHP, CPV, DRB, DRC, DSO, FLH, GAF, GGI(E), GLD, ICF, ICI, JNS, JSC, KMP, MCC, MON, NSC, PPG, PRA, PYI, REL, RH, SW, SYT, UCC, (2).
Homopolymer resins of acrylic and/or methacrylic acid resins:		
Other homopolymer resins of acrylic and/or methacrylic acid esters	Yes	CPV, DUP, GRV, ICF, PYI, RH, SAR, SW, UOC.
Polymethyl methacrylate (PMMA)	Yes	ACY, ART, CTP, CYR, DUP, ICF, JOB, JSC, MRT, PKL, RH, SAR, SQA.
Thermosetting acrylate resins	Yes	CPV, DRC, DSO, DUP, GRV, HAN, ICF, MID, PPG, PRA, REZ, SM.
Cellulose plastics and resins:		
Cellulose acetate	No	EKT.
Cellulose acetate butyrate	No	EKT.
Cellulose acetate propionate	No	EKT.
Ethyl cellulose	No	(2)
Cellulose plastics, all other	No	EKT.
Coumarone-indene resins	No	CPV.
Engineering plastics:	Yes	
Acetal resins	No	DUP, HCL, MCC, PRT, RAS.
Polycarbonate resins	No	DOW, GE, GEP, MOB, SQA.
Polyimides and amide-imide polymers	No	DUP, EW, GE, GEP, GRG, PDI, TNA.
Polyphenylene oxide type resins	No	GE, GEP, JOB.
Polyphenylene sulfide resins	No	PLC.
Fluorocarbon resins:		
Ethylene/chlorotrifluoro ethylene copolymer (Halar)	No	AUS.
Polytetrafluoroethylene (PTFE)	Yes	AUS, DUP, ICI.
Polyvinylidene fluoride resin	No	PAS.
All other fluorocarbon resins	No	AUS, DUP.
Petroleum hydrocarbon resins	No	CFX, CXI, EKX, ENJ, GYR, HPC, ICF, LII, NEV, RCI, (2)

See footnotes at end of table.

Table 25—Continued

Plastics and resin materials for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Plastics and resin materials	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 26)*
Thermoplastic resins—Continued		
Phenoxy (R) resin (other than for coating and adhesives)	No	NEV, UCC.
Plastics alloys or blends	No	MOB.
Polyamide resins:	Yes	
Non-nylon type, polyamide resins	Yes	COO, EFH, GP, HCL, HYA, LII, NCI, PAC, S, SHX, SQA, USM.
Nylon type ,polyamide resins	Yes	ACS, AGI, BCM, CTR, DGO, DUP, GRG, HCL, MON, RSN, USM.
Polybutylene type resins	No	ENJ, SHC.
Polyester resins, saturated:	Yes	
Polybutylene terephthalate(PBT)	No	AGI, GE, GEP, HCL, ICF, MOB, USM.
Polyethylene terephthalate (PET)	Yes	ACS, DUP, EK, EKT, FBI, GEP, GGI, GYR, HCL, ICI, MOB, USM.
All other polyester resins, saturated	Yes	COO, CPV, DUP, EKT, GLD, GRG, GYR, ICF, ICI, MNP, PPG, REL, SW.
Polyethylene and copolymers resins:		
Ethylene-acrylic acid resins (EAA)	No	DOW.
Ethylene-vinyl acetate (EVA) copolymer resins	Yes	COO, ENJ, NSC, USI.
Other ethylene copolymer resins	No	EKT, EKX, ENJ, EVL, RH, SQA.
Specific gravity 0.940 and below (conventional low density)	Yes	ACS, DOW, DUP, EKX, ELP, ENJ, SM, SOC, SQA, UCC, USI, (2)
Specific gravity 0.940 and below (linear low density)	Yes	ENJ, SM, USI.
Specific gravity over 0.940	Yes	ACS, AMO, CNE, DOW, DUP, ENJ, HIM, PLC, SLT, SOC, UCC, USI.
Polyphenyl aromatic ester resins	No	HPC.
Polypropylene polymer and copolymer resins	Yes	AMO, ART, CSD, EKX, ELP, ENJ, HIM, PLC, SHC, SLT, USI.
Polyterpene resins	Yes	ARZ, HPC, RCI, REL, SCN.
Rosin modifications:	Yes	
Modified rosin (unesterified)	Yes	ARZ, CJO, HPC, NCI, SYL, WVA.
Modified rosin esters	Yes	EW, FRP, GP, GRV, HCL, HPC, ICF, LII, MCC, NCI, RCI, SYL, WVA.
Rosin esters, unmodified (Ester gums)	Yes	ARZ, CPV, FJI, FRP, HPC, NCI, PRT, RCI, SYL.
Styrene type plastics materials:		
Acrylonitrile-butadiene-styrene (ABS) terpolymer resins and certain other styrene type plastics materials	Yes	DOW, GEP, GRD, MCB, MON.
Methyl methacrylate-butadiene styrene (MBS) resins and certain other styrene type plastic materials	Yes	FER, GYR, ICI, MRT, RH.
Styrene-acrylonitrile copolymer resins (SAN)	No	BFG, GE, ICI, MCB, MON.
Polystyrene:		
Expandable polystyrene beads	Yes	ATR, BAS, DPI, HMN.
Rubber modified polystyrene	Yes	API, CSD, DOW, DPI, HMN, PLR, SM.
Straight polystyrene	Yes	AEP, AMO, API, ATR, CSD, DOW, DPI, GAF, HGC, HMN, HPC, KTP, PLR, SM, SOC.
Styrene latexes:		
Styrene-butadiene latexes	Yes	DOW, GRD, GYR, PYI, UOC.
All other styrene latexes	Yes	ADC, CCS, CRS, FRS, GNT, GRD, MCC, SPO, UCC, UOC.
Other styrene copolymers:		
α-Methyl styrene polymers	No	AIP, AMO, CPV.
Styrene-allyl alcohol copolymer resins	No	CYR, HPC, MON.
Styrene-divinylbenzene copolymer resins	No	DOW, RH.
Styrene-maleic anhydride copolymer resins	No	ATR, MON.
Styrene-methyl methacrylate copolymer resins	No	ADC, DSO, GGI(E), RCD.
All other styrene copolymers	No	AIP, ARZ, CPV, DSO, DUP, EW, FLH, GEP, HPC, JSC, MON, OBC, PLC, RCD.

See footnotes at end of table.

Table 25—Continued

Plastics and resin materials for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Plastics and resin materials	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 26)*
Thermoplastic resins—Continued		
Vinyl resins:		
Polyvinyl acetate resins	Yes	AIP, CGL, DAN, DSO, FLH, FLN, GLD, GRD, JOB, JSC, MNP, MON, NSC, PRA, PYI, RCI, SCO, SQA, UCC, UOC, (2)
Polyvinyl alcohol resins	No	AIP, DUP, SAC.
Polyvinyl butyral resins	No	MON, SAC.
Polyvinyl formal resin	No	EW, GRG, MON.
Vinyl acetate-acrylate copolymers	Yes	ACO, AIP, DAN, DSO, FLH, FLN, GLD, KMP, MCC, NCJ, NTC, OBC, PRA, RH, SPC, SQA, UCC, UOC.
Polyvinyl chloride and copolymer resins:	Yes	
Polyvinyl chloride homopolymer resins	No	AIP, BFG, BPC, CNT, FOR, GGC, GYR, HKP, KYS, SHT, UCC, VST, VYN.
Vinyl chloride-acetate copolymer resins	No	KYS, MCC.
All other polyvinyl chloride copolymer resins	No	BFG, HKP, VYN.
Polyvinylidine chloride resins:		
Latex type polyvinylidene chloride resins	Yes	BFG, DOW, GRD, UOC.
Solid type polyvinylidene chloride resins	No	DOW.
All other vinyl resins	Yes	DUP, FLH, GLD, NCJ, NTC, RH, UCC, (2)
All other thermoplastic resins,	Yes	DUP, ENJ, LII, MCC, MON, UOC, WLN, (2)

[1] Chemicals for which seperate statistics are reported in this section are indicated by 'Yes.' Chemicals for which data are accepted in confidence and may not be published are indicated by 'No.'
[2] The manufacturer did not consent to his identification with the disignated products.

Source: Compiled from data received in response to questionaires of the U.S. International Trade Commission.

Table 26
Plastics and resin materials: Directory of manufacturers, alphabetical by code, 1988

Code	*Name of company*
ACO	Adco Chemical Co.
ACR	Acme Resin Corp.
ACS	Allied Corp., Allied Signal Corp. Engineered Materials Sector. High Density Polyethylene Business
ACY	American Cyanamid Co.
ADC	Anderson Development Co.
AEP	A & E Plastics Corp.
AGI	EMS-American Grilon, Inc.
AIP	Air Products & Chemicals, Inc.
AMO	Amoco Corp.
APH	Alpha Corporation of Tennessee
API	American Polymers, Inc.
ARK	Armstrong World Industries, Inc.
ARO	Arnco
ART	Aristech Chemical Corp., Chemical Div.
ARZ	Arizona Chemical Co.
ASH	Ashland Oil, Inc.
ASL	SpecialtyChem Products Corp.
ATR	Atlantic Richfield Co., Arco Chemical Co.
AUS	Ausimont N.V.
AUX	Auralux Corp.
BAL	Sherwin-Williams Co., Consumers Div.
BAS	BASF Corp.
BCM	Belding Chemical Industries
BCP	BCP, Inc.
BFG	B. F. Goodrich Co.; B.F. Goodrich Chemical Group
BLC	Ranbar Technology, Inc. Ball Chemical Co.
BMC	Brin-Mont Chemicals, Inc.
BME	Allied Bendix Corp., Friction Materials Div.
BOR	Borden, Inc., Borden Chemical Div.
BPC	Borden Plastics & Chemicals
BPT	Permuthane Inc.
BRU	M. A. Bruder & Sons, Inc.
BSC	Cascade Resins, Inc.
BTL	BTL Specialty Resin Corp.
BUC	Synalloy Corp., Blackman Uhler Chemical Div.
CAS	CasChem, Inc.
CBD	Chembond Corp.
CCC	C.N.C. International Inc.
CCS	Colorado Chemical Specialties, Inc.
CFX	Chemfax, Inc.
CGL	Cargill, Inc.
CGY	Ciba-Geigy Corp.
CHC	Carpenter Chemical Co.
CHP	C. H. Patrick & Co., Inc.
CJO	C. J. Osborn, Div. of Suvar Corp.
CLU	CL Industries, Inc.
CMC	Cosmic Plastics, Inc.
CMP	Commercial Products Co., Inc.
CNE	Cain Chemical, Inc.
CNI	Conap, Inc.
CNT	Certainteed Corp.
COO	H.B. Fuller Co.
CPV	Cook Paint & Varnish Co.
CRS	Colorado Resins, Inc.
CSD	Fina Oil & Chemical Co., Cosden Chemical Div.
CTP	Continential Polymers, Inc.
CTR	Custom Resins Div. of Bemis Co., Inc.
CXI	Chemical Exchange Industries, Inc.
CYR	CYRO Industries
DAN	Dan River, Inc., Chemical Products Div.
DCC	Dow Corning Corp.
DGO	Day-Glo Color Corp.
DNS	Dennis Chemical Co.
DOW	Dow Chemical Co.
DPI	Dart Polymers, Inc. Sub of Dart Container Corp.
DRB	The Derby Co., Inc.
DRC	Dock Resins Corp.
DRR	Delta Resins & Refractories
DSO	DeSoto, Inc.
DUP	E. I. duPont de Nemours & Co., Inc. AF/FP Dept. Chemicals and Pigments Dept. ED/IMG Dept. Mt. Clements Petrochemicals Dept. Polymer Products Dept.
ECC	Eastern Color & Chemical Co.
EFH	E. F. Houghton & Co.
EK	Eastman Kodak Co.:
EKT	Tennessee Eastman Co. Div.
EKX	Texas Eastman Co. Div.
ELP	Rexene Products Company
ENJ	Exxon Chemical Americas
EPI	Ohio Rubber Co., Orthane Div.
EVL	EVAL Company of America
EW	Westinghouse Electric Corp., Insulating Materials Div.
FBI	Fibers Industries, Inc.
FER	Ferro Corp., Keil Chemical Div.
FJI	Cincinnati Varnish Co.
FLH	H. B. Fuller Co.
FLN	Franklin International
FMC	FMC Corp.
FOC	Handschy Industries, Inc., Farac Varnishes & Chemicals
FOR	Formosa Plastics Corp. - U.S.A.
FRE	Freeman Chemical Corp.
FRP	FRP Co.
FRS	Firestone Tire & Rubber Co., Firestone Synthetic Rubber & Latex Co. Div.
GAF	GAF Corp., Chemical Group
GE	General Electric Co.:
GEP	Plastics Div.

Table 26—Continued

Plastics and resin materials: Directory of manufacturers, alphabetical by code, 1988

Code	Name of company
GGC	Georgia-Gulf Corp.:
	PVC Compound Div.
	Plaquemine Div.
GGI	Grow Group, Inc.
GLC	General Latex & Chemical Corp.
GLD	Glidden Co.
GNT	Gencorp Polymers Products
GP	Georgia-Pacific Corp.:
	Resins Operations
GRD	W. R. Grace & Co., Organic Chemicals Div., Polymers & Chemical Div.
GRG	P. D. George Co.
GRV	Guardsman Chemicals, Inc.
GYR	Goodyear Tire & Rubber Co.
HAN	Hanna Chemical Coatings Corp.
HCL	Hoechst Celanese Corp:
	Engineering Plastics Div.
	Sou-Tex Works
HER	Heresite Protective Coatings Inc.
HGC	Goodson Polymers, Inc.
HIL	Hilton Davis Company
HIM	Himont U.S.A., Inc.
	Occidental Chemical Corp.:
HKD	Durez Div.
HKP	PVC Div.
HMN	Huntsman Chemical Corp.
HPC	Hercules, Inc.
HVG	Ametek, Inc., Haveg Div.
HXL	Hexcel Corp., Hexcel Chemical Products Dexter Corp:
HYA	Dexter Adhesives & Structual Materials Div.
HYC	Dexter Electronic Materials Div.
ICF	BASF Corp., Inmont Div.
ICI	ICI Americas, Inc.
	Chemicals Div.
	Resins Div.
INP	Synair Corp.
IOV	Iovite Inc.
IPC	Interplastic Corp.
IRI	Stuart-Ironsides, Inc.
JNS	S.C. Johnson & Son, Inc.
JOB	Jones-Blair Co.
JSC	Sybron Chemicals, Inc.
KMP	Kelly-Moore Paint Co., Inc.
KPT	Beazer Materials & Services, Inc.
KTP	Kent Polymers, Inc.
LC	Lord Corp., Chemical Products Group
LIC	Lilly Industrial Coatings, Inc.
LII	Lawter International, Inc.
MCA	Masonite Corp., Alpine Resin Div.
MCB	Borg-Warner Corp., Borg Warner Chemicals
MCC	McCloskey Corp.:
	McCloskey Varnish Co. of California
	McCloskey Varnish Co. of Oregon
MID	Dexter Corp., Midland Div.
MIL	Milliken & Co., Milliken Chemical Co.
MMM	Minnesota Mining & Manufacturing Co.
MNP	Mcwhorther, Inc.
MOB	Mobay Chemical Corp., Pittsburgh Div.
MON	Monsanto Co.
MRT	Morton-Thiokol, Inc., Morton Chemical Co. Div.
NCI	Union Camp Corp., Chemical Products Div.
NCJ	National Casein of New Jersey
NCP	Niles Chemical Paint Co.
NEV	Neville Chemical Co.
NSC	National Starch & Chemical Corp.
NTC	National Casein Co.
NTL	NL Industries, Inc.
OBC	O'Brien Corp.
OCF	Owens-Corning Fiberglas Corp.
OMC	Olin Corp.
PAC	Pacific Anchor Chemical Corp.
PAS	Pennwalt Corp.
PDI	Phelps Dodge Industries, Inc., Phelps Dodge Magnet Wire Co. Div.
PEL	Pelron Corp.
PER	Perry & Derrick Co., Inc.
PKL	Plaskolite, Inc.
PLC	Phillips 66 Co.
PLN	Disogrin Industries Corp.
PLR	Polysar, Inc.:
	Plastic Div.
PLS	Plastics Engineering Co.
PMC	Plastics Manufacturing Co.
PPG	PPG Industries, Inc.
PPL	Sterling Engineered Products
PRA	Para-Chem Southern
PRC	Products Research & Chemical Corp.
PRT	Pratt & Lambert, Inc., Paint Div.
PSG	PMC Specialites Group
PSL	Plaslok Corp.
PST	Perstorp Compounds, Inc.
PTC	Polycast Technology Corp.
PYI	Morton Thiokol, Inc. Morton Chemical Div.
QCP	Quaker Chemical Corp.
QUN	K. J. Quinn & Co., Inc.
RAS	Surface Coatings, Inc.
RBI	Reeves Brothers, Inc.
RCD	Richardson Polymer Corp.
RCI	Reichhold Chemicals, Inc.
REL	Reliance Universal, Inc., Louisville Resins Operations
REZ	Hi-Tek Polymers, Inc.
RH	Rohm & Haas Co.
RSN	Atochem, Inc., Polymers Div.
RTC	Mount Vernon Mills, Inc.
RUO	Ruco Polymer Corp.
S	Sandoz, Inc., Colors & Chemicals Div.

Table 26—Continued
Plastics and resin materials: Directory of manufacturers, alphabetical by code, 1988

Code	*Name of company*	*Code*	*Name of company*
SAC	Southeastern Adhesives Co.	SPO	Ameripol Synpol Co. Div. of Uniroyal Goodrich Tire Co.
SAR	Esschem Inc.	SQA	Sequa Chemicals, Inc.
SBG	Samuel Bingham Co.	SRY	Synray Corp.
SCN	Schenectady Chemicals, Inc.	SW	Sherwin-Williams Co.
SCO	Scholler, Inc.	SYL	Arizona Chemical Co.
SCP	Henkel Corp.	SYT	Synthron, Inc.
SHC	Shell Oil Co., Shell Chemical Co.	TNA	Ethyl Corp.
SHT	Shintech, Inc.	TXS	Scott Polymers, Inc.
SHX	Sherex Chemical Co.	UCC	Union Carbide Corp.
	BP Chemicals, Inc:	UNO	United-Erie, Inc.
SIC	Silmar Div.	UOC	Union Oil Co. of California
SIF	Filon Div.	USI	Quantum Chemical Corp., USI Division
SLC	Soluol Chem Co., Inc.	USM	Emhart Corp., Bostik U.S. Div.
SLT	Soltex Polymer Corp.	USR	Uniroyal, Inc., Uniroyal Chemical Div.
SM	Mobil Oil Corp.:	UTC	Unitex Chemical Corp.
	Mobil Chemical Co.:	VST	Vista Chemical Co.
	Chemical Products Div.	VSV	Valentine Sugars, Inc., Valite Div.
	Petrochemicals Div.	VYN	Vygen, Inc.
	Polystyrene Business Group	WCA	West Coast Adhesives Co.
SMO	Smooth-On, Inc.	WLN	Wilmington Chemical Corp.
SOC	Chevron Corp., Chevron Chemical Co.	WM	Inolex Chemical Co.
SOR	MW Manufacturers, Inc., Southern Resin Div.	WPG	West Point-Pepperell, Inc., Grifftex Chemical Co. Sub.
SPC	Insilco Corp., Sinclair Paint Co. Div.	WRD	Weyerhaeuser Co.
SPD	General Electric Co., Silicone Products Dept.	WVA	Westvaco Corp.
SPL	Spaulding Composites Co., Inc.		

Note.—Complete names, telephone numbers, and addresses of the above reporting companies are listed in app. A.
Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Section 9

Rubber-Processing Chemicals

Rubber-processing chemicals are organic compounds that are added to natural and synthetic rubber to give them qualities necessary for their conversion into finished rubber goods. In this report, statistics are given for cyclic and acyclic compounds by use—such as accelerators, antioxidants, and vulcanizing agents. Data on production and sales of rubber-processing chemicals in 1988 are given in table 27. Data on production of rubber-processing chemicals during 1984–88 is given in figure 10.

Production of rubber-processing chemicals as a group in 1988 amounted to 353 million pounds, or 8 percent less than the 382 million pounds produced in 1987. Sales of rubber-processing chemicals in 1988 amounted to 266 million pounds, valued at $424 million, compared with 289 million pounds, valued at $359 million, in 1987.

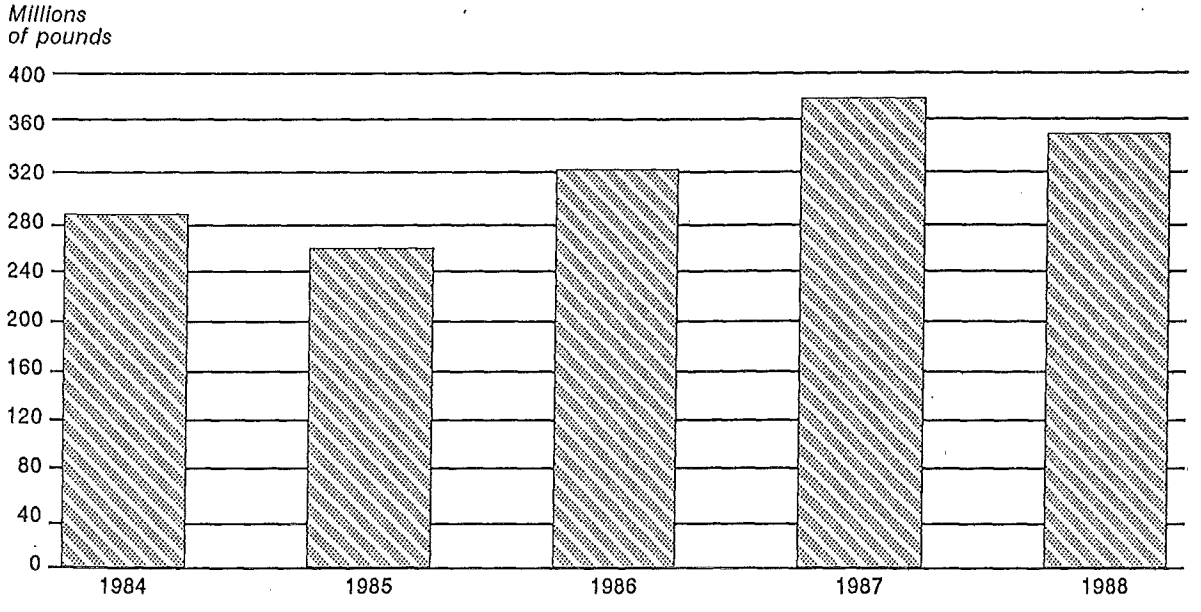
Table 28 lists the products reported in this section and indicates the manufacturer(s) of each by code. These codes are identified by company name in table 29.

The production of cyclic rubber-processing chemicals in 1988 amounted to 318 million pounds, or 10 percent less than the 354 million pounds produced in 1987. Sales of cyclic rubber-processing chemicals in 1988 totaled 236 million pounds, valued at $397 million, compared with 263 million pounds, valued at $336 million, in 1987. Of the total production of cyclic rubber-processing chemicals in 1988, antioxidants, antiozonants, and stabilizers accounted for 70 percent, and accelerators, activators, and vulcanizing agents for 26 percent. Production of antioxidants, antiozonants, and stabilizers, which amounted to 224 million pounds in 1988, included 134 million pounds of amino compounds and 90 million pounds of phenolic and phosphite compounds. Sales of amino antioxidants, antiozonants, and stabilizers in 1988 amounted to 104 million pounds, valued at $168 million; sales of phenolic and phosphite compounds were 56 million pounds, valued at $87 million.

Production of acyclic rubber-processing chemicals in 1988 amounted to 34 million pounds, or 24 percent more than the 28 million pounds produced in 1987. Sales in 1988 totaled 29 million pounds, valued at $27 million, compared with 26 million pounds, valued at $23 million, in 1987.

Cynthia Trainor
202-252-1354

Figure 10
Rubber-processing chemicals: U.S. production, 1984-88



Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 27
Rubber-processing chemicals: U.S. production and sales, 1988

Rubber-processing chemicals	Production	Sales		Average Unit value[1]
		Quantity	Value	
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Grand Total	352,730	265,669	423,913	$1.60
Cyclic				
Total	318,482	236,299	397,388	1.68
Accelerators, activators, and vulcanizing agents, total	83,228	64,662	107,190	1.66
Thiazole derivatives, total	78,507	60,733	91,743	1.51
N-tert-Butyl-2-benzothiazolesulfenamide	19,407	24,158	41,550	1.72
2,2'-Dithiobis[benzothiazole]	11,957	13,150	13,681	1.04
All other thiazole derivatives	47,143	23,425	36,512	1.56
All other accelerators, activators, and vulcanizing agents[2 3]	4,721	3,929	15,447	3.93
Antioxidants, antiozonants, and stabilizers, total	223,662	160,343	255,580	1.59
Amino compounds, total	133,681	104,164	168,354	1.62
Substituted p-phenylenediamines	84,987	55,797	103,551	1.86
All other amino compounds[4]	48,694	48,367	64,803	1.34
Phenolic and phosphite compounds, total[5]	89,981	56,179	87,226	1.55
Polyphenolics	7,813	6,904	24,083	3.49
Phenol, hindered	([6])	1,304	2,654	2.04
All other phenolic and phosphite compounds	82,168	47,971	60,489	1.18
All other cyclic rubber-processing chemicals[7]	11,592	11,294	34,618	3.07
Acyclic				
Total	34,248	29,370	26,525	.90
Accelerators, activators, and vulcanizing agents	5,878	4,726	11,479	2.43
All other acyclic rubber-processing chemicals[8]	28,370	24,644	15,046	.61

[1] Calculated from unrounded figures.
[2] Includes aldehyde-amine reaction products, dithiocarbamates, and other accelerators, activators, and vulcanizing agents.
[3] Data on dithiocarbamates included in this table are for materials used chiefly in the processing of natural and synthetic rubber. Data on dithiocarbamates, which are used chiefly as fungicides, are included in the section on "Pesticides and Related Products."
[4] Includes aldehyde- and acetone-amine reaction products and other amines.
[5] Also includes other antioxidants, antiozonants, and stabilizers.
[6] Reported data were accepted in confidence and may not be published, or no data were reported.
[7] Includes blowing agents, peptizers, and other cyclic rubber-processing chemicals.
[8] Includes polymerization regulators, shortstops, and other acyclic rubber processing chemicals.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 28

Rubber-processing chemicals for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Rubber-processing chemicals	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 29)*
Cyclic		
Accelerators, activators, and vulcanizing agents:	Yes	
Aldehyde-amine reaction products:		
Heptaldehyde-aniline condensate	No	USR.
Triethyltrimethylenetriamine	No	USR.
All other aldehyde-amine reaction products, cyclic	No	DUP.
Dithiocarbamic acid derivatives:		
Dibenzyldithiocarbamic acid, sodium salt	No	USR.
Dibenzyldithiocarbamic acid, zinc salt	No	USR.
2,4-Dinitrophenyl dimethyldithiocarbamate	No	USR.
Thiazole derivatives:	Yes	
N-tert-Butyl-2-benzothiazolesulfenamide	Yes	BFG, MON, USR.
N-Cyclohexyl-2-benzothiazolesulfenamide	No	MON, USR.
2,2'-Dithiobis[benzothiazole]	Yes	BFG, MON, USR.
2-Mercaptobenzothiazole	No	MON, USR.
2-Mercaptobenzothiazole, copper salt	No	ACY.
2-Mercaptobenzothiazole, zinc salt	No	USR, VNC.
N-Morpholinyl-2-benzothiazolyl disulfide	No	GYR.
N-Oxydiethylene-2-benzothiazolesulfenamide	No	BFG, USR.
N-Oxydiethylenethiocarbamyl-N'-oxydiethylene-sulfenamide	No	BFG.
All other thiazole derivatives, cyclic	No	([2]).
All other cyclic accelerators, activators, and vulcanizing agents:	Yes	
Bis(morpholinothiocarbamoyl) disulfide	No	ACY.
Dibenzylamine	No	HXL.
1,3-Dihydro-4(or 5)-methyl-2H-benzimidazole-2-thione	No	VNC.
Dimethylammonium hydrogen isophthalate	No	VNC.
Di-N,N'-pentamethylenethiuram tetrasulfide	No	DUP, VNC.
4,4'-Dithiodimorpholine	No	MON.
2-Mercaptotoluimidazole, zinc salt	No	VNC.
m-Phenylenebismaleimide	No	DUP.
All other accelerators, activators, and vulcanizing agents, cyclic	No	DUP, USR.
Antioxidants, antiozonants, and stabilizers:	Yes	
Amino antioxidants, antiozonants, and stabilizers:	Yes	
Aldehyde- and acetone-amine reaction products:		
Butyraldehyde-aniline condensate	No	DUP.
Diphenylamine-acetone aldehyde	No	USR.
Diphenylamine-acetone condensate	No	BFG, USR.
All other aldehyde and acetone-amine reaction products	No	USR.
Substituted p-phenylenediamines:	Yes	
Alkylaryl-p-phenylenediamines	No	MON.
N,N'-Bis(1,4-dimethylpentyl)-p-phenylenediamine	No	MON, UPM.
N,N'-Bis(1-ethyl-3-methylpentyl)-p-phenylenediamine	No	UPM.
N,N'-Bis(1-methylheptyl)-p-phenylenediamine	No	UPM.
N-Cyclohexyl-N'-phenyl-p-phenylenediamine	No	USR.
Diarylenediamines, mixed	No	GYR.
N-(1,3-Dimethylbutyl)-N'-phenyl-p-phenylenediamine	No	UPM, USR.
N,N'-Di-2-naphthyl-p-phenylenediamine	No	BFG.
N,N'-Diphenyl-p-phenylenediamine	No	BFG.
N-Isopropyl-N'-phenyl-p-phenylenediamine	No	USR.
N-(1-Methylheptyl)-N'-phenyl-p-phenylenediamine	No	UPM.
N-(1-Methylpentyl)-N'-phenyl-p-phenylenediamine	No	USR.
All other p-phenylenediamines, substituted	No	KPI, USR.

See footnotes at end of table.

Table 28—Continued

Rubber-processing chemicals for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Rubber-processing chemicals	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 29)*
Cyclic—Continued		
Antioxidants, antiozonants, and stabilizers—Continued		
Amino antioxidants, antiozonants, and stabilizers—Cont.		
Other amines:		
p-Anilinophenol	No	BFG.
1,2-Dihydro-2,2,4-trimethylquinoline	No	BFG, MON, USR.
Nonyldiphenylamine mixture (mono-, di-, and tri-)	No	USR.
Octyldiphenylamine	No	BFG, USR.
Octyldiphenylamine, alkylated	No	BFG.
p-(p-Toluenesulfonamido)diphenylamine	No	USR.
Phenolic and phosphite antioxidants and stabilizers:	Yes	
Phosphites:		
Alkylaryl phosphites mixed	No	FER, MCB.
Nonylphenyl phosphites, mixed	No	MCB, OMC, USR.
Polymeric phosphites	No	MCB.
Polyphenolic phosphites, polyalkylated	No	BFG, MCB.
Triaryl phosphites	No	MCB.
Polyphenolics (including bisphenols):	Yes	
Bisphenol, hindered	No	USR.
4,4'-Butylidenebis(6-tert-butyl-m-cresol)	No	MON.
2,5-Di-sec-butyldecylhydroquinone	No	USR.
2,5-Di-(1,1-dimethylpropyl)hydroquinone	No	MON.
2,2'-Methylenebis(6-tert-butyl-p-cresol)	No	ACY, FER.
2,2'-Methylenebis(6-tert-butyl-4-ethylphenol)	No	ACY.
1,1,3-Tri(2-methyl-4-hydroxy-5-tert-butylphenyl) butane	No	ICI.
All other phenolic antioxidants and stabilizers:		
Phenol, alkylated	No	ACY, BFG, GYR, NEV.
Phenol, hindered	Yes	FER, GYR, OMC, RCI, USR.
Phenol, styrenated, mixtures	No	NEV, USR.
N-Stearoyl-p-aminophenol	No	HXL.
All other phenolic antioxidants	No	USR.
Blowing agents:		
p,p'-Oxybis(benzenesulfonhydrazide)	No	USR.
5-Phenyltetrazole	No	OMC.
p-Toluenesulfonylhydrazide	No	USR.
p-Toluenesulfonylsemicarbazide	No	USR.
All other blowing agents, cyclic	No	OMC.
Peptizers:		
2',2'''-Dithiobis(benzanilide)	No	ACY.
All other cyclic rubber-processing chemicals:		
p-tert-Amylphenol sulfide (Tackifier)	No	PAS.
4-Chloro-2,6-bis(2,4-dihydroxybenzyl)phenol	No	ICI.
N-(Cyclohexylthio)phthalimide	No	MON.
Diphenyl-4,4'-diphenylmethylenedicarbamate	No	USR.
All other rubber-processing chemicals, cyclic	No	ACY, FER.
Acyclic		
Accelerators, activators, and vulcanizing agents:	Yes	
Dithiocarbamic acid derivatives:		
Dialkyldithiocarbamic acid derivative	No	VNC, VNC, (2),(2).
Dibutyldithiocarbamic acid, nickel salt	No	DUP, USR, VNC.
Dibutyldithiocarbamic acid, sodium salt	No	DUP, USR, VNC.
Dibutyldithiocarbamic acid, zinc salt	No	VNC.
Diethyldithiocarbamic acid, cadmium salt and bis(diethylthiocarbamoyl)disulfide, mixture	No	VNC.
Diethyldithiocarbamic acid, selenium salt	No	VNC.
Diethyldithiocarbamic acid, sodium salt	No	EK, VNC.

See footnotes at end of table.

Table 28—Continued

Rubber-processing chemicals for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Rubber-processing chemicals	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 29)*
Acyclic—Continued		
Accelerators, activators, and vulcanizing agents—Cont.		
Dithiocarbamic acid derivatives—Continued		
Diethyldithiocarbamic acid, tellurium salt	No	VNC.
Diethyldithiocarbamic acid, zinc salt	No	VNC.
Dimethyldithiocarbamic acid, bismuth salt	No	VNC.
Dimethyldithiocarbamic acid, copper salt	No	VNC.
Dimethyldithiocarbamic acid, lead salt	No	VNC.
Dimethyldithiocarbamic acid, selenium salt	No	VNC.
Dimethyldithiocarbamic acid, sodium salt and sodium polysulfide	No	BFG.
Dimethyldithiocarbamic acid, zinc salt	No	VNC.
All other dithiocarbamic acid derivatives, acyclic	No	DUP, ([2]).
Thiurams:		
Bis(dibutylthiocarbamoyl) disulfide	No	VNC.
N,N'-Dioctadecyl-N,N'-diisopropyl thiuram disulfide	No	USR.
Xanthates and sulfides:		
Di-n-butylxantho disulfide	No	USR.
Zinc isopropyl xanthate	No	VNC.
All other accelerators, activators, and vulcanizing agents, acyclic	No	DUP.
Polymerization regulators:		
n-Decyl mercaptan	No	PLC.
n-Dodecyl mercaptans	No	PAS, PLC.
tert-Nonyl mercaptan	No	PAS, PLC.
n-Octyl mercaptan	No	PLC.
All other polymerization regulators, acyclic	No	PLC, USR.
Shortstops:		
Dimethyldithiocarbamic acid, potassium salt	No	USR.
Dimethyldithiocarbamic acid, sodium salt	No	ALC, USR, VCC.
All other acyclic rubber-processing chemicals:		
Waxes and paraffinic products	No	DUP.
Zinc laurate (Activator, physical property improver, and processing auxiliary)	No	USR.

[1] Chemicals for which separate statistics are reported in this section are indicated by 'Yes.' Chemicals for which data are accepted in confidence and may not be published are indicated by 'No.'
[2] The manufacturer did not consent to his identification with the designated products.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 29
Rubber-processing chemicals: Directory of manufacturers, alphabetical by code, 1988

Code	Name of company	Code	Name of company
ACY	American Cyanamid Co.	KPI	Kenrich Petrochemicals, Inc.
ALC	Alco Chemical Corp.	MCB	Borg-Warner Corp., Borg Warner Chemicals
BFG	B. F. Goodrich Co., B.F. Goodrich Chemical Group	MON	Monsanto Co.
DUP	E. I. duPont de Nemours & Co., Inc. Chemicals and Pigments Dept. Polymer Products Dept.	NEV	Neville Chemical Co.
		OMC	Olin Corp.
		PAS	Pennwalt Corp.
EK	Eastman Kodak Co.	PLC	Phillips 66 Co.
FER	Ferro Corp., Ferro Chemical Div.	RCI	Reichhold Chemicals, Inc.
GYR	Goodyear Tire & Rubber Co.	UPM	UOP, Inc.
HXL	Hexcel Corp., Hexcel Chemical Products	USR	Uniroyal, Inc., Uniroyal Chemical Div.
		VCC	Vinings Chemical Co.
ICI	ICI Americas, Inc., Chemicals Div.	VNC	Vanderbilt Chemical Corp.

Note.—Complete names, telephone numbers, and addresses of the above reporting companies are listed in app. A.
Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Section 10

Elastomers

Elastomers (synthetic rubber) are high polymeric materials with properties similar to those of natural rubber. The term "elastomers" as used in this report means substances, whether in bale, crumb, powder, latex, or other crude form, which can be vulcanized or similarly processed into a material that can be stretched to at least twice their original length; and, after having been so stretched and the stress removed, will return with force to approximately their original length. U.S. production and sales of elastomers in 1988 are shown in table 30.

Table 31 lists the products reported in this section and indicates the manufacture(s) of each by code. These codes are identified by company names in table 32.

Total U.S. production[1] of synthetic rubber in 1988 amounted to 4,907 million pounds, an increase of 4.6 percent from that produced in 1987. The production of synthetic rubber increased irregularly from 4,609 million pounds in 1984 to 4,907 million pounds in 1988, or by 6.4 percent. (see figure 11). Total sales of elastomers in 1988 amounted 3,234 million pounds, an increase of 4 percent from that sold in 1987.

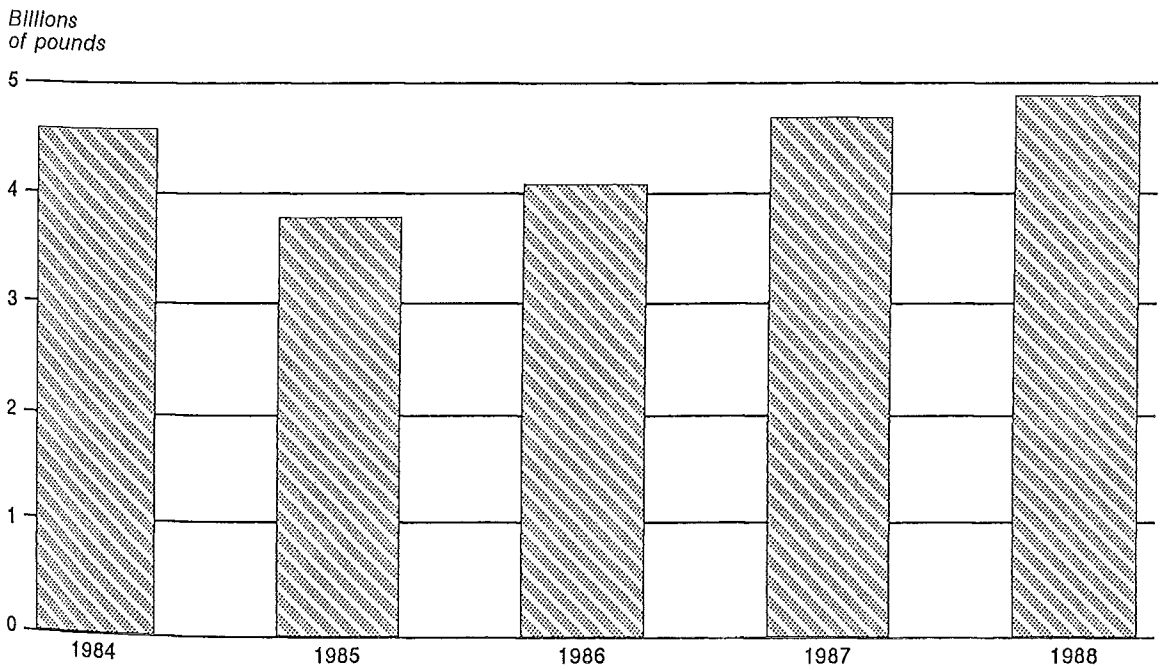
Styrene-butadiene rubber (SBR-type rubber) in 1988 continued to be the elastomer produced in the greatest quantity as it has been for more than 35 years. U.S. production of SBR-type rubber, including 20 million pounds of its vinylpyridine sub-type, amounted to 1,919 million pounds in 1988. Polybutadiene rubber, mainly solution-polymerized type, was produced domestically in 1988 in the next largest amount—765 million pounds. Other principal types of synthetic elastomers for which U.S. production data are reported separately are ethylene-propylene rubber, production of which was 512 million pounds in 1988; butadiene-acrylonitrile (nitrile or NBR-type) rubber, production of which was 178 million pounds; and thermoplastic elastomers (a family of products), production of which was 421 million pounds in 1988.

Sales of SBR-type rubber, including 12 million pounds of its vinylpyridine sub-type, by U.S. producers in 1988 amounted to 1,025 million pounds. Sales of polybutadiene rubber amounted to 385 million pounds, and those of ethylene-propylene rubber to 454 million pounds. Sales of nitrile rubber amounted to 136 million pounds, silicone type elastomer sales amounted to 146 million pounds, and sales of thermoplastic elastomers amounted to 358 million pounds in 1988.

Edward J. Taylor
202-252-1362

[1] Until now urethane type elastomers have been included in the section VIII "Plastics and Resin Materials." The commission has now begun reporting statistics for urethane elastomers in two sections, section VIII, plastics and resin materials, and section X, elastomers (synthetic rubber). Henceforth those polyurethane products classified as "thermoplastic" urethane elastomers will be reported in SOC section X; all other urethane elastomers will remain in SOC section VIII.

Figure 11
Elastomers: U.S. production, 1984-88



Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 30
Elastomers (synthetic rubber):[1] U.S. production and sales, 1988

Elastomers	Production[2]	Sales Quantity[2]	Sales Value	Average Unit value[3]
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Grand total	4,906,572	3,234,468	2,982,130	$0.92
Butadiene-acrylonitrile type (nitrile) (NBR-type)	177,812	135,952	129,062	.95
Ethylene-propylene type (EP-type)	512,374	453,824	366,934	.81
Polybutadiene type (BR-type)	765,494	385,039	189,784	.49
Silicone (Q) type elastomers	([4])	146,078	503,864	3.45
Styrene-butadiene type (SBR-type)[5]	1,899,094	1,012,834	537,240	.53
Styrene-butadiene-vinylpyridine type	20,397	11,852	13,227	1.12
Thermoplastic elastomers (such as styrene-block copolymers, thermoplastic olefin elastomers, thermoplastic poly-urethane elastomers, and co-polyesters)	420,989	357,604	419,807	1.17
All other elastomers[6]	1,110,412	731,285	822,212	1.12

[1] The term "elastomers" is defined as substances in bale, crumb, powder, latex, and other crude forms which can be vulcanized or similarly processed into materials that can be stretched at 68° F. to at least twice their original length and, after having been stretched and the stress removed, will return with force to approximately their original length.
[2] Includes oil content of oil-extended elastomers.
[3] Calculated from unrounded figures.
[4] Reported data are accepted in confidence and may not be published, or no data reported.
[5] More than four-fifth of SBR elastomer production is the dry type of product.
[6] Includes butyl, chlorinated natural rubber, chlorinated polyethylene, epichlorohydrin, fluoroelastomers, polyacrylic ester type, polychloroprene (neoprene) type, polyisoprenes (including cyclorubber), polysulfide, silicone type (production only), and miscellaneous elastomers.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 31

Elastomers for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Elastomers	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 32)*
Cyclic		
Cyclized polyisoprene (Cyclorubber)	No	WAY.
Epichlorohydrin elastomers (CO, ECO) type	No	BFG.
Styrene-butadiene (S or SBR) type:	Yes	
Styrene-butadiene, dry type	No	CPY, FRS, GRD, GYR, SPO.
Styrene-butadiene, latex type	No	BAS, BFG, GYR, MMM, RCI.
Styrene-butadiene-vinylpyridine	Yes	BFG, FRS, GNT, GYR.
All other styrene-butadiene type elastomers	No	ASY, LC.
Thermplastic elastomers (such as styrene-block copolymers, thermoplastic olefin elastomers, thermoplastic polyurethanes elastomers, and co-polyester)	Yes	BFG, DOW, EEP, ENJ, FRS, GEP, MON, SHC.
All other cyclic elastomers	No	TNA.
Acyclic		
Butadiene-acrylonitrile (nitrile) (NBR) type	Yes	BFG, CPY, GYR, MMM, RCI, USR.
Butyl(isobutylene-isoprene) type	No	ENJ.
Chlorinated rubber, natural and synthetic	No	DOW, HPC.
Chlorosulfonated polyethylene (CSM) type	No	DUP.
Ethylene-propylene (EP) type	Yes	CPY, DUP, ENJ, USR
Fluorelastomers (CFM, FKM, FFKM) type	No	DUP, MMM.
Polyacrylate ester type:		
Polyacrylic (ACM) type elastomers	No	ACY, BFG.
Polyalkalene oxide	No	PRC.
Polybutadiene acrylic acid acrylonitrile terpolymer (PBAN)	No	ASY.
Polybutadiene (BR) type	Yes	ASY, FRS, GYR, PLC, RCI, SPO.
Polychloroprene (Neoprene) (CR) type	No	DKA, DUP, LC.
Polyisoprene (IR) type	No	GYR.
Polysulfide (T) type elastomers	No	MRT.
Silicone (Q) type elastomers	Yes	DCC, DUP, SPD, SWS.
All other acyclic elastomers	No	MRT.

[1] Chemicals for which seperate statistics are reported in this section are indicated by 'Yes.' Chemicals for which data are accepted in confidence and may not be published are indicated by 'No.'

Source: Compiled from data received in response to questionaires of the U.S. International Trade Commission.

Table 32
Elastomers (synthetic rubber): Directory of manufacturers, alphabetical by code, 1988

Code	Name of company	Code	Name of company
ACY	American Cyanamid Co.	GYR	Goodyear Tire & Rubber Co.
ASY	American Synthetic Rubber Corp.	HPC	Hercules, Inc.
BAS	BASF Corp.	LC	Lord Corp., Chemical Products Group
BFG	B. F. Goodrich Co., B.F. Goodrich Chemical Group	MMM	Minnesota Mining and Manufacturing Co.
		MON	Monsanto Co.
CPY	Copolymer Rubber & Chemical Corp.	MRT	Morton-Thiokol, Inc., Morton Chemical Co. Div
DCC	Dow Corning Corp.		
DKA	Mobay Synthetics Corp.	PLC	Phillips 66 Co.
DOW	Dow Chemical Co.	PRC	Products Research & Chemical Corp.
DUP	E. I. duPont de Nemours & Co., Inc.: Polymer Products Dept.	RCI	Reichold Chemicals, Inc.
		SHC	Shell Oil Co., Shell Chemical Co.
EEP	Fluorcarbon Company	SPD	General Electric Co., Silicone Products Dept.
ENJ	Exxon Chemical Americas:		
FRS	Firestone Tire & Rubber Co., Firestone Synthetic Rubber & Latex Co. Div.	SPO	Ameripol Co., Div. of Uniroyal Goodrich Tire Co.
GEP	General Electric Co., Plastics Div.	SWS	Wacker Silicones
GNT	Gencorp Polymers Products	TNA	Ethyl Corp
GRD	W. R. Grace & Co., Polymers & Chemical Div.	USR	Uniroyal, Inc., Uniroyal Chemical Div.
		WAY	Olin Hunt Speciality Products, Inc.

Note.—Complete names, telephone numbers, and addresses of the above reporting companies are listed in app A.
Source: Compiled from data recieved in response to questionnaires of the U.S. International Trade Commission.

Section 11

Plasticizers

Plasticizers are organic chemicals that are added to synthetic plastics and resin materials to (1) improve workability during fabrication, (2) extend or modify the natural properties of these materials, or (3) develop new improved properties not present in the original material. Table 33 presents statistics on U.S. production and sales of plasticizers in as great a detail as is possible without revealing the operations of individual producers. U.S. production of plasticizers totaled 2,300 million pounds in 1988, an increase of 15.1 percent from the 1,998 million pounds reported for 1987. The trend of production of these products is shown in the graph in figure 12 Sales of plasticizers totaled 1,874 million pounds, valued at $1,001 million, in 1988, compared with 1,876 million pounds, valued at $896 million, in 1987.

Production of cyclic plasticizers in 1988, which consisted chiefly of the esters of phthalic anhydride, phosphoric acid, and trimellitic acid, amounted to 1,775 million pounds, an increase of 22.0 percent from the 1,455 million pounds reported for 1987. Sales of cyclic plasticizers in 1988 totaled 1,440 million pounds, valued at $700 million, compared with 1,452 million pounds, valued at $628 million, in 1987. The most important cyclic plasticizers were the dioctyl phthalates, with production of 344 million pounds, in 1988.

Production of acyclic plasticizers in 1988 totaled 526 million pounds, decrease of 3.2 percent from the 543 million pounds reported for 1987. Sales of acyclic plasticizers totaled 434 million pounds, valued at $301 million, in 1988, compared with 424 million pounds, valued at $268 million, in 1987. Adipic acid esters were the most important acyclic plasticizers in 1988 with production of 153 million pounds.

Table 34 lists the products reported in this section and indicates the manufacturer(s) of each by code. These codes are identified by company name in table 35.

Jesse Lawrence Johnson
202-252-1351

Figure 12
Plasticizers: U.S. production, 1984-88

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 33
Plasticizers: U.S. production and sales, 1988

Plasticizers	Production[1]	Sales Quantity	Sales Value	Average Unit value[2]
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Grand total	2,300,416	1,873,590	1,001,303	$0.53
Benzenoid[3]	1,996,422	1,598,590	820,105	.51
Nonbenzenoid	303,994	275,000	181,198	.66
Cyclic				
Total	1,774,602	1,439,828	700,084	.49
Phthalic anhydride esters, total	1,623,214	1,307,189	590,139	.45
Dibutyl phthalates (including diisobutyl phthalates)	25,460	22,731	11,188	.49
Diethyl phthalates (including diisoethyl phthalates)	26,162	17,054	29,150	1.71
Diisodecyl phthalate[4]	176,953	169,597	69,685	.41
Diisononyl phthalate	221,347	200,939	80,806	.40
Dioctyl phthalates[4]	344,268	352,889	141,635	.40
Di-tridecyl phthalate	27,202	24,755	14,203	.57
All other phthalic anhydride esters	801,822	519,224	243,472	.47
Trimellitic acid esters	54,875	60,673	44,937	.74
All other cyclic plasticizers[5]	96,513	71,966	65,008	.90
Acyclic				
Total	525,814	433,762	301,219	.69
Adipic acid esters, total	152,605	98,069	70,455	.72
Di(2-ethylhexyl) adipate	50,042	52,432	29,294	.56
Diisodecyl adipate	2,084	3,430	1,376	.40
Ditridecyl adipate	6,267	6,236	5,870	.94
All other adipic acid esters	94,212	35,971	33,915	.94
Complex linear polyesters and polymeric plasticizers, total	88,216	67,658	55,710	.79
Adipic acid type	54,452	53,298	42,045	.82
All other complex linear polyester & polymeric plasticizers	33,764	14,360	13,665	.95
Epoxidized esters, total	134,910	130,251	68,821	.53
Epoxidized soya oil esters	114,832	113,153	55,713	.49
All other epoxidized esters	20,078	17,098	13,108	.76
Oleic acid esters, total	11,898	11,857	7,680	.65
Butyl oleate	1,610	1,508	1,040	.69
Decyl oleate	375	287	527	1.83
All other oleic acid esters	9,913	10,062	6,113	.61
2-Ethylhexyl palmitate	(6)	2,136	1,847	.86
Di(2-ethylhexyl) sebacate	3,201	2,982	4,388	1.47
Stearic acid esters, total	12,967	12,738	9,308	.73
n-Butyl stearate	6,427	6,807	3,955	.58
Isobutyl stearate	2,902	2,654	1,462	.55
All other stearic acid esters	3,638	3,277	3,891	1.19
Sucrose acetate isobutyrate	3,708	3,346	4,849	1.45
All other acyclic plasticizers[7]	118,309	104,725	78,161	.75

See footnotes at end of table.

Footnotes for table 33—Continued

[1] Includes data for compounds used principally (but not exclusively) as primary plasticizers. Does not include clearly defined extenders or secondary plasticizers.
[2] Calculated from unrounded figures.
[3] Includes benzenoid products as defined in part 1, schedule 4, of the Tariff Schedules of the United States Annotated.
[4] The difference between the production reported here and that shown on the *Preliminary Report on U.S. Production of Selected Organic Chemicals (Including Synthetic Plastics and Resin Materials), 1987,* results from a combination of incorrect reporting by some companies, end-of-year inventory adjustments, and rounding.
[5] Includes data for cresyl diphenyl phosphate, dibutyl phenyl phosphate, diphenyl octyl phosphate, tricresyl phosphate, triphenyl phosphate, and other cyclic phosphoric acid esters, glycol dibenzoates, toluenesulfonamides, tetrahydrofurfuryl oleate, and other cyclic plasticizers.
[6] Reported data were accepted in confidence and may not be published, or no data were reported.
[7] Includes data for azelaic acid esters, citric and acetylcitric acid esters, myristic acid esters, pelargonic acid esters, ricinoleic and acetylricinoleic acid esters, glyceryl and glycol esters, and other acyclic plasticizers.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 34

Plasticizers for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Plasticizers	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 35)*
Cyclic	Yes	
N-n-butyl benzenesulfonamide	No	TNA, UTC.
Diethylene glycol dibenzoate	No	KLM, VEL.
Dipropanediol dibenzoate (Dipropylene glycol dibenzoate)	No	KLM, VEL.
N-Ethyl-p-toluenesulfonamide	No	NES, UTC.
Glyceryl tribenzoate	No	VEL.
Phosphoric acid esters:		
Isodecyl diphenyl phosphate	No	MON.
Tricresyl phosphate	No	FMC.
Triphenyl phosphate	No	FMC, MON.
All other phosphoric acid esters	No	FMC, MON, SM.
Phthalic anhydride esters:	Yes	
Bis(2-ethylhexyl)terephthlate	No	EKT.
Butyl benzyl phthalate	No	MON.
Butyl 2-ethylhexyl phthalate	No	BAS.
Butyl octyl phthalates	No	ART.
Cyclohexyl isooctyl phthalate	No	UTC.
Di(2-butoxyethyl) phthalate	No	HAL.
Dibutyl phthalate (including diisobutyl phthalate)	Yes	ART, BAS, EKT, HCC, MRF, NOD, UTC, WTH.
Dicyclohexyl phthalate	No	UTC, (2).
Diethylene glycol phthalate	No	CMB.
Diethyl phthalate (Diethyl isophthalate)	Yes	EKT, MON, MRF, (2).
Di-(n-heptyl-n-nonyl) phthalate	No	BAS, SC.
Di-(n-heptyl-n-nonyl) undecyl phthalate	No	BAS, ENJ, SC.
Diisodecyl phthalate	Yes	ART, BAS, ENJ, HCC, MON, NOD, TEK.
Diisohexyl phthalate	No	ENJ.
Diisononyl phthalate	Yes	ART, BAS, ENJ, TEK.
Dimethyl isophthalate	No	UTC, (2).
Dimethyl phthalate	No	EKT, MRF, UTC, WTC.
Dinonyl phthalate	No	ENJ, SC.
Di-tridecyl phthalate	Yes	ART, ENJ, HCC, NOD, SM, TEK.
Diundecyl phthalate	No	ART, SC.
2-Ethylhexyl cyclohexyl phthalate	No	HCC.
Hexyl n-decyl phthalate	No	VST.
n-Octyl n-decyl phthalate	No	ART, VST.
Phthalic acid, diallyl ester	No	TNA.
Dioctyl phthalates:	Yes	
Di(2-ethylhexyl) isophthalate	No	MRF.
Di(2-ethylhexyl) phthalate	No	ART, BAS, EKT, ENJ, HCC, TEK.
Diiso-octyl phthalate	No	ENJ, HAL, HCC, NOD, TEK.
Di-n-octyl phthalate	No	EK.
All other dioctyl phthalates	Yes	BAS, HCC, WTH.
Glycol phthalate esters:		
Butyl phthalyl butyl glycolate	No	(2)
All other phthalic anhydride esters	No	BAS, MON, NOD, SC, TEK, WTC.
Polyethylene glycol dibenzoate	No	VEL.
Tetrahydrofurfuryl oleate	No	WTC.
Toluenesulfonamide o-, p-mixtures	No	UTC.
Trimellitic acid esters:	Yes	
Tri(2-ethylhexyl) trimellitate	No	BAS, ENJ, HCC, TEK.
Tri-n-hexyltrimellitate	No	(2)
Triisodecyl trimellitate	No	ENJ, HCC, WM.
Triisononyl trimellitate	No	ART, TEK.
Triisooctyl trimellitate	No	ENJ, HAL, NOD, TEK.
Trimethyl trimellitate	No	FER, (2).
Tri-n-octyl n-decyl trimellitate	No	HAL.
Trioctyl trimellitate	No	ART, EKT.
All other trimellitic acid esters	No	ART, HAL, TEK, (2), (2).
All other cyclic plasticizers	Yes	BOE, NEV, NOD, UTC.

See footnotes at end of table.

Table 34—Continued

Plasticizers for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Plasticizers	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 35)*
Acyclic	Yes	
Adipic acid esters:	Yes	
Butylene glycol adipate	No	HAL.
Di(2-(2-butoxyethoxy)ethyl) adipate	No	HAL, MON.
Dibutoxyethyl adipate	No	EKT, HAL.
Di(2-ethylhexyl) adipate	Yes	ART, BAS, EKT, ENJ, HAL, HCC, MON, MRF, NOD, TEK, WTH.
Di-n-hexyl adipate	No	EKT, MON.
Diisobutyl adipate	No	HAL, HCC, MRF, WTC.
Diisodecyl adipate	Yes	HAL, HCC, MRF, NOD, TEK.
Diisononyl adipate	No	ART, ENJ, TEK.
Diisooctyl adipate	No	HCC.
Diisopropyl adipate	No	VND, WTH.
Dimethyl adipate	No	MRF, (2).
Di-n-octyl adipate	No	WM, WTH.
Ditridecyl adipate	Yes	EMR, HCC, NOD, SM, WM.
Ethylene glycol adipate	No	HAL.
Neopentyl glycol adipate	No	HAL.
n-Octyl n-decyl adipate	No	ART, HCC.
All other adipic acid esters	Yes	HAL, HCC, MON, PCI, WTC.
Azelaic acid esters:		
Bis(hydroxypropyl) azelate	No	EMR.
Di(2-ethylhexyl) azelate	No	EMR, HAL, TEK.
All other azelaic acid esters	No	WTC.
Citric and acetylcitric acid esters:		
Tributyl acetylcitrate	No	UTC.
Tributyl citrate	No	(2)
Triethyl acetylcitrate	No	(2)
Triethyl citrate	No	(2)
All other citric and acetylcitric acid esters	No	CCL, (2).
Complex linear polyesters and polymeric plasticizers:	Yes	
Adipic acid type complex linear polyesters and polymeric plasticizers	*Yes	EMR, HAL, MRF, TEK, WTC, WTH.
All other complex linear polyesters and polymeric plasticizers	Yes	ARZ, EKX, EMR, SBC, SM, TEK, VND, WTC.
Epoxidized esters:	Yes	
Epoxidized linseed oils	No	UCC, WTC, VIK.
Epoxidized pentaerythritol tetraphthalate	No	UCC.
Epoxidized soya oils	Yes	FER, FMC, TEK, UCC, WTC, VIK.
2-Ethylhexyl epoxytallates	No	UCC.
Octyl epoxystearates	No	WTC.
All other epoxidized esters	Yes	REZ, UCC, VIK.
Glyceryl tripropionate	No	EKT.
Glutaric acid esters:		
Neopentyl glycol glutarate	No	HAL.
All other glutaric acid esters	No	HAL.
Lauric acid esters:		
All other lauric acid esters	No	HAL.
Myristic acid esters:		
Isopropyl myristate	No	WM, WTH.
Myristyl ethoxy myristate	No	SCP.
All other myristic acid esters	No	CAS, WTH.
Octandic acid esters:		
All other octanoic acid esters	No	HAL.
Oleic acid esters:	Yes	
Butyl oleate	Yes	CHL, EMR, HAL, WTC, WTH.
Decyl oleate	Yes	SBC, SCP, VND.
2-Ethylhexyl oleate	No	HAL.
Glyceryl trioleate (Triolein)	No	EMR, WTC.
Isobutyl oleate	No	SBC.

See footnotes at end of table.

Table 34—Continued

Plasticizers for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Plasticizers	Separate statistics[1]	Manufacturers' identification codes (according to list in table 35)
Acyclic—Continued		
Oleic acid esters—Continued		
Isooctyl oleate	No	HAL.
Methyl oleate	No	EMR, WTC.
Neopentyl glycol dioleate	No	HCC.
Oleyl oleate	No	SBC.
Propyl oleates:		
n-Propyl oleate	No	EMR.
Trimethylolpropane trioleate	No	HCC.
All other oleic acid esters	No	HAL.
Palmitic acid esters:		
n-Butyl palmitate	No	EKT.
2-Ethylhexyl palmitate	Yes	VND, WM, WTH.
Isobutyl palmitate	No	WTH.
Isopropyl palmitate	No	CAS, WM, WTH.
All other palmitic acid esters	No	SBC.
Pelargonic acid esters:		
Glycol pelargonate	No	EMR.
Isodecyl pelargonate	No	EMR.
All other pelargonic acid esters	No	CAS, SBC, WM.
Phosphoric acid esters:		
Tri(2-butoxyethyl) phosphate	No	FMC, MON.
Triethyl phosphate	No	EKT.
Ricinoleic and acetylricinoleic acid esters:		
n-Butyl acetylricinoleate	No	CAS.
Butyl ricinoleate	No	CAS.
Glyceryl monoricinoleate	No	CAS.
Glyceryl tri(acetylricinoleate)	No	CAS.
Methyl ricinoleate	No	CAS.
All other ricinoleic and acetylricinoleic acid ester	No	CAS.
Sebacic acid esters:		
Dibutoxyethyl sebacate	No	HAL.
Dibutyl sebacate	No	HAL, HCC, WM, (2).
Di(2-ethylhexyl) sebacate	Yes	HAL, HCC, TEK, WM, (2).
Diisopropyl sebacate	No	SBC, (2).
Dimethyl sebacate	No	EMR, UTC, (2), (2).
Propylene glycol sebacate	No	HAL.
Stearic acid esters:	Yes	
n-Butyl stearate	Yes	CHL, EMR, SCP, WM, WTC, WTH.
2-Ethylhexyl stearate	No	HCL, TCH, WM.
Glyceryl triacetyl stearate	No	CAS.
Hexadecyl stearate	No	HCL.
Isobutyl stearate	Yes	EMR, SCP, WM, WTC, WTH.
Isodecyl stearate	No	WM.
Myristyl stearate	No	VND.
2-Octyldecyl-12-stearoyl stearate	No	VND.
Tridecyl stearate	No	HCC, WM.
All other stearic acid esters	Yes	SBC, SCP, VND, WM, WTC.
Sucrose acetate isobutyrate	Yes	EKT, HAL, UCC.
Triethylene glycol di(caprylate-caprate)	No	HAL, WM.
Triethylene glycol di(2-ethylbutyrate)	No	HAL.
Triethylene glycol di(2-ethylhexanoate)	No	EKT, EKX, HAL.
All other acyclic plasticizers	Yes	ARZ, HCC, HPC, WM.

[1] Chemicals for which seperate statistics are reported in this section are indicated by 'Yes.' Chemicals for which data are accepted in confidence and may not be published are indicated by 'No.'
[2] The manufacturer did not consent to his identification with the disignated products.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 35
Plasticizers: Directory of manufacturers, alphabetical by code, 1988

Code	*Name of company*	*Code*	*Name of company*
ART	Aristech Chemical Corp., Chemical Div.	FMC	FMC Corp.
ARZ	Arizona Chemical Co.	HAL	C. P. Hall Co.
BAS	BASF Corp.	HCC	Hatco Chemical Corp.
BOE	Boehme Filatex, Inc.	HCL	Hoechst Celanese Corp.,
CAS	CasChem, Inc.		Sou-Tex Works
CCL	Catawba-Charlab, Inc.	HPC	Hercules, Inc.
CHL	Chemol Co.	KLM	Kalama Chemical, Inc.
CMB	Cambridge Industries Co.	MON	Monsanto Co.
EK	Eastman Kodak Co.:	MRF	Morflex Chemical Co., Inc.
EKT	Tennessee Eastman Co. Div.	NES	Ruetgers-Nease Chemical Co.
EKX	Texas Eastman Co. Div.	NEV	Neville Chemical Co.
EMR	Quantum Chemical Corporation	NOD	Huls America, Inc.
	Corporation Emery Division	PCI	Piedmont Chemical Industries
ENJ	Exxon Chemical Americas	WM	Inolex Chemical Co.
FER	Ferro Corp.:	WTC	Witco Chemical Corp.
	Ferro Chemical Div.	WTH	Union Camp Corp.
	Grant Chemical Div.		

Note.—Complete names, telephone numbers, and addresses of the above reporting companies are listed in app. A.
Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Section 12

Surface-Active Agents

The surface-active agents included in this report are organic chemicals that reduce the surface tension of water or other solvents and are used chiefly as detergents, dispersing agents, emulsifiers, foaming agents, or wetting agents in either aqueous or nonaqueous systems. Waxes and products used chiefly as plasticizers are excluded. Surface-active agents are produced from natural fats and oils, from silvichemicals such as lignin, rosin, and tall oil, and from chemical intermediates derived from coal tar and petroleum. A major part of the output of the bulk chemicals shown in this report is consumed in the form of packaged soaps and detergents for household and industrial use. The remainder is used in the processing of textiles and leather, in ore flotation and oil-drilling operations, and in the manufacture of agricultural sprays, cosmetics, elastomers, foods, lubricants, paint, pharmaceuticals, and many other products.

The statistics for production and sales of surface-active agents (table 36) are grouped by ionic class and by chemical class and subclass. All quantities are reported in terms of 100-percent organic surface-active ingredients and thus exclude all inorganic salts, water, and other diluents. Sales statistics reflect sales of bulk surface-active agents only; sales of formulated products are excluded. Data for "all other" in each of the categories, which was published in previous editions, can be derived by subtracting from the totals of each category the sum of the enumerated items within that category. Data for the production of surface-active agents during 1984–88 are shown in figure 13.

Total U.S. production of surface-active agents in 1988 amounted to 7,316 million pounds, or 17 percent more than the 6,269 million pounds reported for 1987. Sales of bulk surface-active agents in 1988 amounted to 4,261 million pounds, valued at $2,303 million, compared with sales in 1987 of 3,923 million pounds, valued at $1,713 million. In terms of quantity, sales in 1988 were 9 percent more than in 1987.

Production of anionic surface-active agents in 1988 amounted to 4,560 million pounds, or 62 percent of the total surfactant output reported for 1988. Sales of anionics in 1988 amounted to 2,075 million pounds, valued at $631 million.

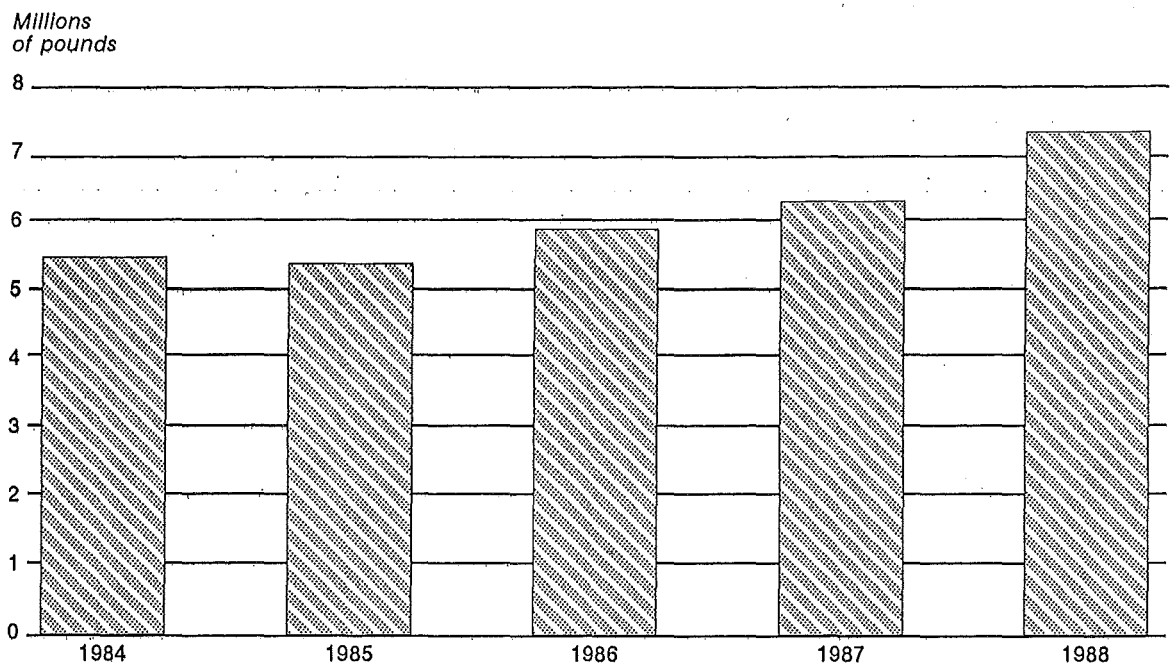
Production of cationic surface-active agents in 1988 amounted to 703 million pounds, 7 percent more than the 655 million pounds reported in 1987. Production of nonionic surface-active agents amounted to 2,012 million pounds in 1988, 5 percent more than the 1,909 million pounds reported in 1987. Sales of cationic surface-active agents in 1987 decreased by 2 percent in terms of quantity, and by 7 percent in terms of value when compared with sales as reported in 1987. Sales of nonionics in 1988 increased by 3 percent in terms of quantity, and by 57 percent in terms of value when compared with sales as reported in 1987.

The difference between production and sales reflects inventory changes and captive consumption of surface-active agents by synthetic rubber producers, and by manufacturers of cosmetics, packaged detergents, bar soaps, and other formulated consumer products. In some instances the difference may also reflect quantities of surface-active agents used as chemical intermediates, e.g., nonionic alcohol and alkylphenol ethoxylates, which may be converted to anionic surface-active agents by phosphation or sulfation.

Table 37 lists the products reported in this section and indicates the manufacturer(s) of each by code. These codes are identified by company name in table 38.

Eric Land
202-252-1349

Figure I3
Surface-active agents: U.S. production, 1984-88



Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 36

Surface-active agents: U.S. production and sales, 1988

Surface-active agents	*Production*[1]	*Sales*[2] *Quantity*	*Sales*[2] *Value*	*Average Unit value*[3]
	1,000 pounds	*1,000 pounds*	*1,000 dollars*	*Per pound*
Grand total	7,316,076	4,261,221	2,303,251	$0.54
Benzenoid[4]	1,622,076	911,753	513,475	.56
Nonbenzenoid	5,694,000	3,349,468	1,789,776	.53
Amphoteric				
Total	41,120	38,734	38,493	.99
(Carboxymethyl) [3-(coconut oil amido)propyl] dimethylammonium hydroxide, inner salt	7,305	7,249	8,932	1.23
N-Dodecyl-3-iminodipropionic acid, disodium salt	171	171	259	1.51
(Mixed alkyl) sulfobetaine	563	480	386	.80
N-(Tallow alkyl)-3-iminodipropionic acid, disodium salt	183	183	244	1.33
All other amphoteric surface active agents	32,898	30,651	28,672	.94
Anionic				
Total	4,559,548	2,074,638	631,257	.30
Carboxylic acids (and salts thereof), total	1,269,290	250,230	100,080	.40
Amine salts of fatty, rosin, and tall oil acids, total	3,613	2,304	2,314	1.00
Stearic acid, triethanolamine salt	372	76	93	1.24
All other amine salts of fatty, rosin, and tall oil acids	3,241	2,228	2,221	1.00
Coconut oil acids, potassium salt	(5)	1,157	3,652	3.16
Coconut oil acids, sodium salt	186,778	6,727	2,520	.37
Oleic acid, sodium salt	264	(5)	(5)	(5)
Rosin acids, potassium salt	92,559	91,882	23,175	.25
Stearic acid, potassium salt	142	68	351	5.18
Tall oil acids, potassium salt	11,110	4,040	2,174	.54
Tallow acids, sodium salt	404,348	38,612	9,939	.26
All other carboxylic acids (and salts thereof)	570,476	105,440	55,955	.53
Phosphoric and polyphosphoric acid esters (and salts thereof), total	63,086	46,360	46,120	.99
Alcohols and phenols, alkoxylated and phosphated, total	45,669	35,378	32,785	.93
Decyl alcohol, ethoxylated and phosphated	1,132	1,018	912	.90
Dinonylphenol, ethoxylated and phosphated	1,114	1,105	1,171	1.06
Mixed linear alcohols, ethoxylated and phosphated	7,681	7,460	7,044	.94
Nonylphenol, ethoxylated and phosphated	7,160	6,365	6,052	.95
Octylphenol, ethoxylated and phosphated	(5)	1,514	1,677	1.11
Phenol, ethoxylated and phosphated	1,738	1,747	1,213	.69
Tridecyl alcohol, ethoxylated and phosphated	5,726	(5)	(5)	(5)
All other alcohols and phenols, alkoxylated and phosphated	21,118	16,169	14,716	.91
Decyl and octyl phosphate	1,741	1,672	1,632	.98
2-Ethylhexyl phosphate	795	627	614	.98
Mixed alkyl phosphate	3,635	2,460	3,007	1.22
All other phosphoric and polyphosphoric acid esters (and salts thereof)	11,246	6,223	8,082	1.30
Sulfonic acids (and salts thereof), total	2,285,658	1,506,957	338,861	.22
Alkylbenzenesulfonates, total	819,090	211,375	121,501	.57
Dodecylbenzenesulfonic acid	360,916	113,950	55,742	.49
Dodecylbenzenesulfonic acid, calcium salt	5,096	3,032	3,788	1.25
Dodecylbenzenesulfonic acid, isopropylamine salt	4,845	3,949	3,462	.88

See footnotes at end of table.

Table 36—Continued
Surface-active agents: U.S. production and sales, 1988

Surface-active agents	Production[1]	Sales[2] Quantity	Sales[2] Value	Average Unit value[3]
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Anionic—Continued				
Sulfonic acids (and salts thereof)—Continued				
Alkylbenzenesulfonates—Continued				
Dodecylbenzenesulfonic acid, (mixed alkyl) amine salt	279	102	138	$1.36
Dodecylbenzenesulfonic acid, sodium salt	267,804	74,768	48,862	.65
Dodecylbenzenesulfonic acid, triethanolamine salt	13,335	13,005	7,213	.55
All other alkylbenzene sulfonates	166,815	2,569	2,296	.89
Benzene-, cumene-, toluene-, and xylenesulfonates, total	157,912	135,056	30,777	.23
Xylenesulfonic acid, ammonium salt	12,498	12,242	3,069	.25
Xylenesulfonic acid, sodium salt	107,839	101,176	21,051	.21
All other benzene-, cumene-, toluene-, and xylenes sulfonates	37,575	21,638	6,657	.31
Lignin sulfonates and naphthalenesulfonates, total	1,095,083	1,066,062	104,493	.10
Diisopropylnaphthalenesulfonic acid, sodium salt	1,605	1,390	2,569	1.85
Lignin sulfonic acid, ammonium salt	3,424	5,844	486	.08
Lignin sulfonic acid, calcium salt	556,050	530,435	24,603	.05
Lignin sulfonic acid, sodium salt	178,360	178,013	24,177	.14
All other lignin sulfonates and naphthalene-sulfonates	355,644	350,580	52,658	.15
Sulfosuccinamic acid derivatives	3,491	3,396	2,344	.69
Sulfonic acids having ester or ether linkages, total	171,156	57,092	51,706	.91
Sulfosuccinic acid esters, total	32,543	27,186	28,109	1.03
Sulfosuccinic acid, bis(2-ethylhexyl)ester, sodium salt	24,615	20,478	21,614	1.06
Sulfosuccinic acid, monolaureth ester disodium salt	288	288	379	1.31
All other sulfosuccinic acid esters	7,640	6,420	6,116	.95
All other sulfonic acids having ester or ether linkages	138,613	29,906	23,597	.79
All other sulfonic acids (and salts thereof)	38,926	33,976	28,040	.83
Sulfuric acid esters (and salts thereof), total[6]	941,514	271,091	146,196	.54
Acids, amides, and esters, sulfated, total	8,799	6,121	4,765	.78
Butyl oleate, sulfated, sodium salt	1,390	1,291	664	.51
All other acids, amides, and esters, sulfated	7,409	4,830	4,101	.85
Alcohols, sulfated, total	401,422	90,700	62,403	.69
Decyl sulfate, sodium salt	1,308	805	441	.55
Dodecyl sulfate, ammonium salt	30,145	16,397	8,061	.49
Dodecyl sulfate, magnesium salt	([5])	51	81	1.59
Dodecyl sulfate, sodium salt	24,282	23,991	22,939	.96
Dodecyl sulfate, triethanolamine salt	5,261	3,817	3,100	.81
2-Ethylhexyl sulfate sodium salt	1,697	1,669	2,168	1.30
Mixed linear alcohols, sulfated, triethanolamine salt	17,939	6,760	5,504	.81
All other alcohols, sulfated	320,790	37,210	20,109	.54
Ethers, sulfated, total[6]	504,065	150,974	61,839	.41
Dodecyl alcohol, ethoxylated and sulfated, sodium salt	858	858	797	.93
Dodecyl alcohol, ethoxylated and sulfated, sodium salt	8,956	8,956	10,640	1.19
Mixed linear alcohols, ethoxylated and sulfated, sodium salt	222,616	38,222	19,973	.52
All other ethers, sulfated[6]	271,635	102,938	30,429	.30
Natural fats and oils, sulfated, total	27,228	23,296	17,189	.74
Castor oil, sulfated, sodium salt	3,915	3,777	3,142	.83
Tall oil, sulfated, sodium salt	208	112	60	.53

See footnotes at end of table.

Table 36—Continued

Surface-active agents: U.S. production and sales, 1988

Surface-active agents	Production[1]	Sales[2] Quantity	Sales[2] Value	Average Unit value[3]
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Anionic—Continued				
Sulfuric acid esters (and salts thereof)—Continued				
Natural fats and oils, sulfated—Continued				
Tallow, sulfated, sodium salt	472	362	218	$.60
All other natural fats and oils, sulfated	22,633	19,045	13,769	.72
Cationic				
Total	703,209	402,672	381,109	.95
Amine oxides and oxygen-containing amines (except those having amide linkages), total	177,176	58,777	49,567	.84
Acyclic, total	168,481	52,498	42,976	.82
N,N-Bis(2-hydroxyethyl)octadecylamine	159	110	154	1.41
N,N-Bis(2-hydroxyethyl) (tallow alkyl)amine	6,470	4,049	3,562	.88
(Coconut oil alkyl)amine, ethoxylated	5,158	4,729	2,862	.61
(Hydrogenated tallow alkyl)amine, ethoxylated	966	903	724	.80
(9-Octadecenyl)amine, ethoxylated	2,111	1,954	1,487	.76
Octadecylamine, ethoxylated	1,175	1,036	1,985	1.92
(Soybean oil alkyl)amine, ethoxylated	190	313	392	1.25
(Tallow alkyl)amine, ethoxylated	7,933	7,402	6,080	.82
N-(tallow alkyl) trimethylene diamine, ethoxylated	1,521	1,452	1,399	.96
All other acyclic	142,798	30,550	24,331	.80
Cyclic (including imidazoline and oxazoline derivatives), total	8,695	6,279	6,591	1.05
1-(2-Hydroxyethyl)-2-nonyl-2-imidazoline	1,077	1,071	1,505	1.40
1-(2-Hydroxyethyl)-2-nor(tall oil alkyl)-2-imidazoline	(5)	320	524	1.64
All other cyclic (including imidazoline and oxazoline derivatives)	7,618	4,888	4,562	.93
Amines and amine oxides having amide linkages	58,057	40,472	31,132	.77
Amines, not containing oxygen (and salts thereof), total	230,853	87,991	75,133	.85
Amine salts, diamines and polyamines	33,250	23,553	17,375	.74
Monoamines, total	197,603	64,438	57,758	.90
(Hydrogenated tallow alkyl)amine	7,578	3,741	2,588	.69
9-Octadecenylamine	9,751	4,228	3,400	.80
(Soybean oil alkyl)amine	4,227	(5)	(5)	(5)
All other monoamines	176,047	56,469	51,770	.92
Quaternary ammonium salts, containing oxygen, total	42,446	37,313	38,066	1.02
(Coconut oil alkyl)-bis-(2-hydroxyethyl, ethoxylated)-methylammonium chloride	279	249	296	1.19
All other quaternary ammonium salts, containing oxygen	42,167	37,064	37,770	1.02
Quaternary ammonium salts, not containing oxygen, total	182,299	167,373	154,941	.93
Acyclic, total	158,735	149,024	136,554	.92
Bis(coconut oil alkyl)dimethylammonium chloride	3,500	3,348	4,194	1.25
Bis(hydrogenated tallow alkyl)dimethylammonium chloride	79,222	78,358	55,440	.71
N-(coconut oil alkyl) aminobutyric acid, sodium salt	2,494	2,473	3,631	1.47
Hexadecyltrimethyl ammonium bromide	(5)	90	307	3.41
Trimethyl(tallow alkyl)ammonium chloride	4,268	3,298	2,737	.83
All other acyclic	69,251	61,457	70,245	1.14
Benzenoid, total[4]	23,564	18,349	18,387	1.00
Benzyldimethyl(mixed alkyl)ammonium chloride	6,787	5,834	7,351	1.26

See footnotes at end of table.

Table 36—Continued

Surface-active agents: U.S. production and sales, 1988

Surface-active agents	Production[1]	Sales[2] Quantity	Sales[2] Value	Average Unit value[3]
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Cationic—Continued				
Quaternary ammonium salts, not containing oxygen—Continued				
Benzenoid—Continued				
Benzyldimethyloctadecylammonium chloride	1,227	599	586	$.98
Benzyltrimethylammonium chloride	3,985	2,423	1,942	.80
All other benzenoid	11,565	9,493	8,508	.90
All other cationic surface-active agents	12,378	10,746	32,270	3.00
Nonionic				
Total	2,012,199	1,745,177	1,252,392	.72
Carboxylic acid amides, total	186,658	145,902	61,082	.42
Diethanolamine codensates (amine/acid Ratio = 2/1), total	16,860	14,817	11,214	.76
Coconut oil acids	3,635	3,326	2,455	.74
Coconut oil and tallow acids	6,761	6,761	5,273	.78
Lauric and myristic acids	322	296	320	1.08
Oleic acid	771	646	503	.78
Stearic acid	46			
Tall oil acids	2,309	983	651	.66
All other diethanolamine condensates (amine/acid Ratio = 2/1)	3,016	2,805	2,012	.72
Diethanolamine condensates (other amine/acid ratios), and other carboxylic acid amides, total	169,798	131,085	49,868	.38
Coconut oil acids (amine/acid Ratio = 1/1)	28,513	25,367	15,997	.63
Coconut oil acid-ethanolamine condensate (amine/acid ratio = 1/1)	2,472	2,752	1,669	.61
Coconut oil acid-ethanolamine condensate (amine/acid ratio = 1/1), ethoxylated	476	440	332	.75
Lauric acid (amine/acid Ratio = 1/1)	1,908	1,819	1,835	1.01
Lauric and myristic acids (amine/acid Ratio = 1/1)	1,050	1,051	933	.89
Linoleic acid (amine/acid Ratio = 1/1)	117	110	152	1.38
Stearic acid (amine/acid Ratio = 1/1)	114	102	97	.95
All other diethanolamine condensates (other amine/acid ratios), and other carboxylic acid amides	135,148	99,444	28,853	.29
Carboxylic acid esters, total	421,591	341,528	483,391	1.42
Anhydrosorbitol esters, total	117,198	118,588	299,314	2.52
Anhydrosorbitol monolaurate	6,511	6,546	5,065	.77
Anhydrosorbitol monostearate	61,651	63,022	12,308	.20
Anhydrosorbitol sesquioleate	1,040	1,073	970	.90
Anhydrosorbitol trioleate	1,971	1,935	1,522	.79
All other anhydrosorbitol esters	46,025	46,012	279,449	6.07
Diethylene glycol esters, total	5,481	2,728	1,908	.70
Diethylene glycol monolaurate	222	222	176	.79
Diethylene glycol monostearate	68	68	76	1.10
All other diethylene glycol esters	5,191	2,438	1,656	.68
Ethoxylated sorbitol and anhydrosorbitol esters, total	32,766	31,100	27,655	.89
Ethoxylated anhydrosorbitol monolaurate	7,343	7,080	6,690	.94
Ethoxylated anhydrosorbitol mono-oleate	3,950	4,126	3,354	.81
Ethoxylated anhydrosorbitol monostearate	13,020	11,631	9,825	.84
Ethoxylated anhydrosorbitol trioleate	3,065	3,106	2,572	.83
Ethoxylated anhydrosorbitol tristearate	748	717	649	.91
All other ethoxylated sorbitol and anhydrosorbitol esters	4,640	4,440	4,565	1.03

See footnotes at end of table.

Table 36—Continued
Surface-active agents: U.S. production and sales, 1988

Surface-active agents	Production[1]	Sales[2] Quantity	Sales[2] Value	Average Unit value[3]
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Nonionic—Continued				
Carboxylic acid esters, total—Continued				
Ethylene glycol distearate	3,586	3,624	2,554	$.70
Ethylene glycol monostearate	3,607	3,343	2,529	.76
Glycerol esters, total	101,105	68,104	58,026	.85
Glycerol mono-oleate	3,852	3,633	3,418	.94
Glycerol monostearate	21,662	11,964	9,969	.83
All other glycerol esters	75,591	52,507	44,639	.85
Natural fats and oils, ethoxylated, total	33,301	24,899	19,925	.80
Castor oil, ethoxylated	14,155	9,768	6,893	.71
Hydrogenated castor oil, ethoxylated	3,453	3,213	3,099	.96
Lanolin, ethoxylated	1,012	992	765	.77
All other natural fats and oils, ethoxylated	14,681	10,926	9,168	.84
Polyethylene glycol esters, total	60,006	49,969	40,446	.81
Polyethylene glycol diester of tall oil acids	4,296	910	633	.70
Polyethylene glycol dilaurate	1,348	1,217	1,083	.89
Polyethylene glycol dioleate	4,340	2,757	2,601	.94
Polyethylene glycol distearate	2,472	2,404	2,998	1.25
Polyethylene glycol monolaurate	7,608	7,587	5,304	.70
Polyethylene glycol mono-oleate	5,020	4,787	3,485	.73
Polyethylene glycol monopalmitate	1,362	1,495	1,461	.98
Polyethylene glycol monopelargonate	3,594	(5)	(5)	(5)
Polyethylene glycol monostearate	6,100	6,079	5,152	.85
Polyethylene glycol sesquiester of tall oil acids	1,808	1,829	1,139	.62
All other polyethylene glycol esters	22,058	20,904	16,590	.79
Polyglycerol esters, total	1,168	1,223	1,838	1.50
Polyglycerol mono-oleate	690	690	938	1.36
All other polyglycerol esters	478	533	900	1.69
1,2-Propanediol monostearate	1,602	1,097	1,418	1.29
All other carboxylic acid esters	61,771	36,853	27,778	.76
Ethers, total	1,382,096	1,247,847	690,459	.55
Benzenoid ethers, total[4]	525,289	463,559	267,749	.58
Dinonylphenol, ethoxylated	4,307	3,539	3,507	.99
Dodecylphenol, ethoxylated	10,457	9,745	6,352	.65
Iso-octylphenol, ethoxylated	(5)	41,681	37,780	.91
(Mixed alkyl)phenol-formaldehyde, alkoxylated	10,589	(5)	(5)	(5)
Nonylphenol, ethoxylated	393,396	346,726	181,313	.52
Nonylphenol, ethoxylated and propoxylated	1,233	1,068	821	.77
Nonylphenol-formaldehyde, alkoxylated	5,216	(5)	(5)	(5)
n-Octylphenol, ethoxylated	1,598	1,292	906	.70
All other benzenoid ethers	98,493	59,508	37,070	.62
Nonbenzenoid ethers, total	766,297	721,126	366,855	.51
Chemically-defined linear alcohols, ethoxylated, total	32,094	24,386	22,859	.94
Decyl alcohol, ethoxylated	12,481	8,866	6,379	.72
Dodecyl alcohol, ethoxylated	5,079	4,289	3,497	.82
9-Octadecenyl alcohol, ethoxylated	2,645	1,780	2,005	1.13
Oleyl alcohol, ethoxylated	1,142	1,025	1,357	1.32
All other chemically-defined linear alcocols, ethoxylated	10,747	8,426	9,621	1.14
Mixed linear alcohols, alkoxylated, total	734,203	696,740	343,996	.49
Mixed linear alcohols, ethoxylated	641,625	632,100	311,082	.49
Mixed linear alcohols, ethoxylated and propoxylated	24,714	23,039	17,226	.75
All other mixed linear alcohols, alkoxylated	67,864	41,601	15,688	.38

See footnotes at end of table.

Table 36—Continued

Surface-active agents: U.S. production and sales, 1988

Surface-active agents	Production[1]	Sales[2] Quantity	Sales[2] Value	Average Unit value[3]
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Nonionic—Continued				
Ethers—Continued				
Other ethers and thioethers, total	90,510	63,162	55,855	$.88
Mixed alcohols, ethoxylated	1,117	647	536	.83
Poly(mixed ethylene, propylene) glycol	15,172	5,189	4,302	.83
Tridecyl alcohol, ethoxylated	10,939	9,211	6,113	.66
All other ethers and thioethers	63,282	48,115	44,904	.93
All other nonionic surface-active agents	21,854	9,900	17,460	1.76

[1] All quantities are given in terms of 100 percent organic surface-active ingredient.
[2] Sales include products sold as bulk surface-active agents only.
[3] Calculated from unrounded figures.
[4] The term "benzenoid" used in this report, describes any surface-active agent, except lignin derivatives, whose molecular structure includes 1 or more 6-membered carbocyclic or heterocylic rings with conjugated double bonds (e.g., the benzene ring or the pyridine ring).
[5] Reported data were accepted in confidence and may not be published, or no data were reported.
[6] Includes all other anionic surface-active agents.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 37

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Surface-active agents	*Separate statistics* [1]	*Manufacturers' identification codes (according to list in table 38)*
Amphoteric		
1,1-Bis(carboxymethyl)-2-undecyl-2-imidazolinium chloride, disodium salt	No	BRD.
Bis(2-hydroxyethyl)tallowammonium ethanoate	No	MIR.
Capramidopropyl betaine	No	AAC.
3-[Caprylamidoethylene-(2-hydroxyethyl)amino]-propionic acid	No	MIR.
Caprylamphopropionate	No	MOA.
1-Carboxyethyl-1-(2-hydroxyethyl)-2-heptyl-2-imidazolinium hydroxide, sodium derivative, sodium salt	No	MIR.
1-Carboxyethyl-1-(2-hydroxyethyl)-2-nonyl-2-imidazolinium hydroxide, sodium derivative, sodium salt	No	MIR.
(1-Carboxyheptadecyl)trimethylammonium hydroxide, inner salt	No	DUP.
Carboxymethyl-3-cocoamidopropyl dimethyl ammonium chloride, sodium salt	No	ENJ.
(Carboxymethyl) [3-(coconut oil amido)propyl]-dimethylammonium hydroxide, inner salt	Yes	AAC, GAF, MIR, PPG, SBC, SCP, SHX, WM, WTC.
1-Carboxymethyl-2-heptadecyl-1-(2-hydroxyethyl)-2-imidazolinium hydroxide, sodium derivative, sodium salt	No	MIR.
1-Carboxymethyl-1-(2-hydroxyethyl)-2-heptyl-2-imidazoliniumhydroxide, sodium derivative, sodium salt	No	MIR.
1-Carboxymethyl-1-(2-hydroxyethyl)-2, imidazolinium hydroxide sodium derivative, sodium salt	No	BRD.
1-Carboxymethyl-1-(2-hydroxyethyl)-2-nonyl-2-imidazolinium hydroxide, sodium derivative, sodium salt	No	BRD, MIR.
1-Carboxymethyl-1-(2-hydroxyethyl)-2-undecyl-2-imidazolinium hydroxide, sodium derivative, sodium salt	No	MIR.
1-Carboxymethyl-1-(2-hydroxyethyl)-2-undecyl-2-imidazoliniumhydroxide, sodium derivative, sodium salt	No	MIR.
(Carboxymethyl)-3-(lauryl amido propyl dimethyl ammonium hydroxide inner salt	No	MIR, PPG.
(1-Carboxyundecyl)trimethylammonium hydroxide, inner salt	No	([2]).
Cocoamidoamphoglycinate	No	MOA.
Cocoamidopropyl betaine	No	MOA.
N-Cocoamidopropyl-N,N-dimethylamine oxide	No	MOA.
3-[3-(Cocoamidopropyl)dimethylammonio]-2-hydroxypropane sulfonate	No	MIR.
3-Cocoamidopropyl-2-hydroxy-3-sulfopropyldimethyl ammonium hydroxide, inner salt	No	SCP, SHX.
Cocoamphocarboxyglycinate	No	MOA.
Cocoamphocarboxypropionate	No	MOA.
Cocoamphopropionate	No	MOA.
N-(Coconut oil alkyl)-β-alanine, partial sodium salt	No	SCP.
N-(Coconut oil alkyl)-β-alanine, sodium salt	No	DUP.
3-[(Coconut oil alkyl)amidoethylene-(2-hydroxyethyl)-amino]propionic acid	No	MIR.
N,N-di(hydroxyethyl)-n-carboxymethyl tallow ammonium quat, inner salt	No	SHX.

See footnotes at end of table.

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Surface-active agents	Separate statistics [1]	Manufacturers' identification codes (according to list in table 38)
Amphoteric—Continued		
Dodecyl disodium banaline, N-(2-carboxyethyl), sodium salt	No	GAF.
N-Dodecyl-3-iminodipropionic acid	No	MOA, SCP.
N-Dodecyl-3-iminodipropionic acid, disodium salt	Yes	AAC, MIR, MOA, SCP.
N-Dodecyl-3-imino-dipropionic acid, monosodium salt	No	MIR.
Heptadecylmethylbenzimidazolinesulfonic acid, sodium salt	No	BRD.
Hexylisonanylamidocarboxylic acid, monoethanolamine salt	No	HCL.
1-Hydroxyethyl-1-(2-hydroxy-3-sodium sulfonatopropyl) -2-capryl-2-imidazolinium hydroxide	No	MIR.
1-Hydroxyethyl-1-(2-hydroxy-3-sodium sulfonatopropyl) -2-nor-coconut oil fatty acids-2-imidazolinium hydroxide	No	MIR.
1-Hydroxyethyl-1-(2-hydroxy-3-sodium sulfonatopropyl-2-oleyl-2-imidazolinium hydroxide	No	MIR.
1-(2-Hydroxyethyl)-1-(sodium carboxymethyleneoxyethylene)-2-nor-coconut oil fatty acids-2-imidazolinium hydroxide	No	MIR.
Isodecyloxypropyliminopropionic acid, monosodium salt	No	ENJ.
Isonanylamidocaproic acid, triethanolamine salt	No	SHX.
Isostearic amphopropionate	No	MOA.
Laurylamidopropyl betaine	No	MOA.
Laurylamphoglycinate	No	MOA.
Mixed acyclic primary amines, ethoxylated and sulfated, sodium salt	No	RH.
(Mixed alkyl)sulfobetaine	Yes	BRD, MOA, PPG, SBC, WM, (2).
Oleamidopropyl betaine	No	AAC.
Oleic acid-ethylenediamine condensate, propoxylated and sulfated, sodium salt	No	MOA.
Oleyl betaine	No	SCP.
1-(Sodium carboxyethylene)-1-(sodium carboxymethyleneoxyethylene)-2-nor-(tall oil fatty acids)-2-imidazolinium hydroxide	No	MIR.
1-(Sodium carboxymethyl)-1-(sodium carboxymethyleneoxyethylene)-2-nor-(coconut oil fatty acids)-2-imidazolinium lauryl sulfate	No	MIR.
N-(Tallow alkyl)-3-iminodipropionic acid, disodium salt	Yes	MIR, MOA, SCP.
Tridecyloxypoly(ethyleneoxy)propionic acid, potassium salt	No	MRV.
All other acyclic amphoteric surface-active agents	No	BRD, CGY, DUP, MIR, MOA, PPG, S, (2).
All other cyclic amphoteric surface-active agents	No	PPG, SBC, SCP.
Anionic		
Carboxylic acids (and salts thereof):		
Amine salts of fatty, rosin, and tall oil acids:		
Coconut oil acids, diethanolamine salt	No	AAC, SHX.
Coconut oil acids, ethanolamine salt	No	SBP.
Isostearic acid, mixed isopropanolamines salt	No	(2).
Isostearic acid, triethanolamine salt	No	PCI.
Oleic acid, diethanolamine salt	No	AAC.
Oleic acid, mixed isopropanolamine salt	No	UTC, (2).
Oleic acid, triethanolamine salt	No	CCL, CPC, (2).
3-Propanoic acid, cocoamino, sodium salt	No	PCI.
Rosin acids, triethanolamine salt	No	CPC.

See footnotes at end of table.

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Surface-active agents	*Separate statistics* [1]	*Manufacturers' identification codes (according to list in table 38)*
Anionic—Continued		
Carboxylic acids (and salts thereof)—Continued		
Amine salts of fatty, rosin, and tall oil acids—Continued		
Stearic acid, N,N,N',N'-tetrakis(2-hydroxyethyl)-ethylenediamine salt	No	ICI.
Stearic acid, triethanolamine salt	Yes	AAC, BRD, PCI, SBP, (2).
Tall oil acids, diethanolamine salt (condensate)	No	AAC, SHX.
Tall oil acids, triethanolamine salt	No	PNX.
(Tall oil fatty acids), triethanolamine salt	No	WVA.
Tallow acids, triethanolamine salt	No	CPC, ENJ, SBP.
All other amine salts of fatty, rosin, and tall oil acids	No	S, (2).
Carboxylic acids having amide, ester, or ether linkages:		
Butoxyethylene oxyacetic acid, sodium salt	No	MIR.
5(or 6)-Carboxy-4-hexyl-2-cyclohexene-1-octanoic acid, reaction products with castor oil	No	(2).
N-(Coconut oil acyl)sarcosine, sodium salt	No	ENJ, HMP.
N,N-Dimethyl capramide	No	PEL.
Dodecyloxypoly(ethyleneoxy)acetic acid, sodium salt	No	MIR.
N-Lauroylsarcosine, sodium salt	No	AAC, HMP.
Maleic acid, monoalkyl ester	No	(2).
Mixed(secondary linear alcohol)polyethylene propionic acid, sodium salt	No	CHP.
Naphthenic acid, ethoxylated	No	(2).
Nonylphenol poly(ethyleneoxy)acetic acid, sodium salt	No	BRI.
Poly(oxy-1,2-ethanediyl), ω-(2-carboxyethoxy)-ω'-hydroxy-α,α'-(iminodi-2,1-ethanediyl)-bis-,N-tallow alkyl derivs), potassium salt	No	MIR.
Poly(oxy-1,2 ethanediyl)-α-carboxy-methyl, ω-(tri-decyloxy), potassium salt	No	PCI.
Tridecyloxypoly(ethyleneoxy)acetic acid, sodium salt	No	FTX, HCL, HMP, S.
All other carboxylic acids with amide, ester or ether linkage	No	S, SCP.
Potassium and sodium salts of fatty, rosin, and tall oil acids:		
Alkoxy triacryl titanate	No	KPI.
Animal grease, sodium salt	No	NMC.
5(or 6)-Carboxy-4-hexyl-2-cyclohexene-1-octanoic acid, potassium/sodium salts	No	(2).
Castor oil acids, potassium salt	No	CAS, GRL.
Citric acid, sodium salts (50%) in sodium phosphates (20%)	No	HCL.
Coconut oil acids and oleic acid, potassium salt	No	HCL.
Coconut oil acids, potassium salt	Yes	AGP, CON, ESS, GRL, HEW, HIP, HNT, LUR, NMC, PG, PNX.
Coconut oil acids, sodium salt	Yes	BSW, CON, CP, ENJ, HEW, LEV, NMC, NPR, PG, (2).
Corn oil acids, potassium salt	No	HNT, NMC.
Gluconic acid, potassium and sodium salts with 20 percent mix of sodium bisulfite-formaldehyde	No	HCL.
Heptanoic acid, potassium salt	No	(2).
Hexyl(isonanoyl anide)carboxylic acid, mono, triethanolamine salts	No	HCL.

See footnotes at end of table.

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Surface-active agents	Separate statistics [1]	Manufacturers' identification codes (according to list in table 38)
Anionic—Continued		
Carboxylic acids (and salts thereof)—Continued		
Potassium and sodium salts of fatty, rosin, and tall oil acids—Continued		
Hexyl(isonanoyl anide)carboxylic acid, triethanol-diethanolamine, mixed salts	No	HCL.
Isonanoic acid, sodium salt	No	HCL.
Isostearic acid, isoproxy titanium salt	No	KPI.
Lauric acid, potassium salt	No	PG.
Mixed vegetable fatty acids, potassium salt	No	EFH, GRL.
Mixed vegetable fatty acids, sodium salt	No	NMC.
Mixed wool grease and tall oil fatty acids	No	SLM.
Neoalkoxy, trineodecanoyl titanate	No	KPI.
Neoalkoxy, trineodecanoyl zirconate	No	KPI.
Oleic acid, ammonium salt	No	CCC.
Oleic acid, potassium salt	No	BSW, CPC, HAL, HNT, PG, VKR, (2).
Oleic acid, sodium salt	Yes	BSW, HAL, SCP.
Olive oil acids, sodium salt	No	HNT.
Palmitic and stearic acids, sodium salt	No	BRI.
Palm kernel oil acids, potassium salt	No	PG.
Palm kernel oil acids, sodium salt	No	NMC, PG.
Palm oil acids, sodium salt	No	BSW.
Rosin acids, potassium salt	Yes	ARZ, PG, WVA, (2).
Rosin acids, sodium salt	No	ARZ, SLM, (2).
Stearic acid, ammonium salt	No	BSW.
Stearic acid, potassium salt	Yes	AAC, CON, HEW, PNX.
Stearic acid, sodium salt	No	CON, LEV, NOC.
Tall oil acids, mixed salts	No	WVA.
Tall oil acids, potassium salt	Yes	CCC, CON, DAN, ESS, FER, HIP, HNT, PNX, WVA.
Tall oil acids, sodium salt	No	CON, NMC, WVA, (2).
Tallow acids, potassium salt	No	AGP, PG, PNX.
Tallow acids, sodium salt	No	BSW, CON, CP, HEW, LEV, NMC, NPR, PG, (2).
All other potassium and sodium salts of fatty, rosin, and tall oil acids	No	MOA, QCP, USR.
Other carboxylic acids:		
All other carboxylic acids,	No	WVA.
Phosphoric and polyphosphoric acid esters (and salts thereof):		
Alcohols and phenols, alkoxylated and phosphated:		
C_{12}–C_{15} alcohol, ethoxylated, propoxylated and phosphated	No	GAF.
Butyl alcohol, ethoxylated and phosphated	No	GAF.
Decyl alcohol, ethoxylated and phosphated	Yes	BRI, GAF, MCP, OC, RPC, TCH.
Decyl alcohol, ethoxylated and phosphated, potassium salt	No	BRI.
Dinonylphenol, ethoxylated and phosphated	Yes	CPC, ETC, GAF, PPG, WTC.
Dodecyl alcohol, ethoxylated and phosphated	No	CPC, ENJ, GAF, HCL, VKR.
Dodecyl alcohol, ethoxylated and polyphosphated	No	PG.
Dodecylphenol, ethoxylated and phosphated	No	GAF.
2-Ethylhexanol and ethoxylated nonylphenol, polyphosphated	No	CCC.
2-Ethylhexanol and ethoxylated nonylphenol, polyphosphated, sodium salt	No	CCC.
2-Ethylhexanol, ethoxylated and phosphated	No	ETC, HCL, SCP, UTC.
2-Ethylhexanol, ethoxylated, phosphated, potassium salt	No	BRI.
Meta, para-cresol, ethoxylated and polyphosphated, neutralized	No	GAF.

See footnotes at end of table.

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Surface-active agents	*Separate statistics* [1]	*Manufacturers' identification codes (according to list in table 38)*
Anionic—Continued		
Phosphoric and polyphosphoric acid esters (and salts thereof)—Continued		
Alcohols and phenols, alkoxylated and phosphated—Continued		
Mixed linear alcohols, alkoxylated and phosphated, potassium salt	No	PCI.
Mixed linear alcohols, ethoxylated and phosphated	Yes	AAC, CRT, ENJ, ETC, FER, FTX, GAF, HCL, HIP, HRT, LUR, MOA, MRV, PPG, RPC, TCH, VKR, WTC, (2), (2).
Mixed linear alcohols, ethoxylated and phosphated, sodium salt	No	CHP.
Nonylphenol, ethoxylated and phosphated	Yes	AAC, ARL, CPC, CRT, CTL, DEX, ESS, ETC, GAF, GDC, HCL, HRT, LUR, MCP, MOA, OC, OMC, PEL, PPG, RPC, TCC, UTC, VKR, WTC.
Nonylphenol, ethoxylated and phosphated, diethanolamine salt	No	OMC, WTC.
Nonylphenol, ethoxylated and phosphated, sodium salt	No	WTC.
9-Octadecenyl alcohol, ethoxylated and phosphated	No	ETC, GAF, HCL, PPG.
Octylphenol, ethoxylated and phosphated	Yes	LUR, PPG, RH, RPC, WTC.
Octylphenol, ethoxylated and phosphated, magnesium salt	No	CTL.
Phenol, ethoxylated and phosphated	Yes	ETC, GAF, LUR, MOA, PEL, PPG, WTC.
Phenol, ethoxylated and phosphated, diethanolamine salt	No	AAC.
Polyhydric alcohol, ethoxylated and phosphated	No	DEX, GAF.
Tridecyl alchol, ethoxylated and phosphated, polyalkylene polyamine salt	No	(2).
Tridecyl alcohol, ethoxylated and phosphated	Yes	CCL, DAN, DEX, ETC, GAF, HCL, HIP, MIL, VKR, WTC, (2), (2).
All other alcohols and phenols, alkoxylated and phosphated or polyphosphated	No	DEX, ETC, PPG, SCP.
Alcohols, phosphated or polyphosphated:		
Butoxyethyl phosphate	No	AAC.
Butyl methyl pyrophosphate, ethlenedioxy titanium salt/N,N-dimethylaminoethylmethacrylate salt	No	KPI.
Butyl methyl pyrophosphate, isopropoxy titanium salt, octyl phosphite adduct	No	KPI.
Butyl phosphate	No	HRT.
Butyl phosphate, potassium salt	No	DUP.
Decyl and octyl phosphate	Yes	APC, ENJ, ETC, HCL, SCP, SHX.
Decyl polyphosphate, sodium salt	No	CRD.
Ethyl alcohol, phosphated, amine salt	No	UTC.
2-Ethylhexyl phosphate	No	APC, BRD, CHP, ETC, FER, FTX, GAF, HIP, MCP, OC, OMC, PPG, VKR.
2-Ethylhexylphosphate, potassium salt	No	PCI.
2-Ethylhexylphosphate, sodium salt	No	CHP, DAN, ENJ, PAT, S.
2-Ethylhexylpolyphosphate, sodium salt	No	DEX.
Hexadecyldiphosphate	No	(2).
Hexadecylmonophosphate	No	(2).
Hexyl phosphate	No	ETC, FTX, HCL, ICI.
Hexyl phosphate, potassium salt	No	ICI.
Alcohols, phosphated or polyphosphated:		
N-2-(C_5 to C_{17})alkylamido-N-carboxyethyl, N-2-hydroxyethyl, 3-amino-2-hydroxypropyl phosphate, disodium salt	No	MOA.
Isooctyl phosphate	No	BOE, BRI, QCP.

See footnotes at end of table.

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Surface-active agents	Separate statistics [1]	Manufacturers' identification codes (according to list in table 38)
Anionic—Continued		
Phosphoric and polyphosphoric acid esters (and salts thereof)—Continued		
Alcohols, phosphated or polyphosphated—Continued		
Isooctyl phosphate, potassium salt	No	BRI.
Methylbutyl pyrophosphate, ethylenedioxy titanium salt	No	KPI.
Mixed alkyl phoshate, sodium salt	No	(2).
Mixed alkyl phosphate	Yes	CTL, DUP, HCL, OC, TCH, WTC, (2).
Mixed alkyl phosphate, alkylamine salt	No	(2).
Mixed alkyl phosphate, diethanolamine salt	No	DUP, SCP.
Mixed alkyl phosphate, potassium salt	No	HCL.
Mixed alkyl phosphate, triethanolanine salt	No	(2).
Neoalkoxy tris(dioctyl)pyrophosphato zirconate	No	KPI.
Octyl diphosphate, oxoethylene titanium salt	No	KPI.
Octyl phosphate, alkylamine salt	No	(2).
Octyl phosphate, isoproxy titanium salt	No	KPI.
Octyl phosphate neoalkoxy titanium salt	No	KPI.
Octyl polyphosphate	No	DEX.
Octyl polyphosphate, potassium salt	No	DEX.
Octyl pyrophosphate, ethylenedioxy titanium salt	No	KPI.
Octyl pyrophosphate, ethylenedioxy titanium salt/dimethylamino methacrylate salt	No	KPI.
Octyl pyrophosphate, isoproxy titanium salt	No	KPI.
Octyl pyrophosphate neoalkoxy titanium salt	No	KPI.
Octyl pyrophosphate, oxoethylenedioxy titanium salt	No	KPI.
Tridecyl phosphate	No	HCL.
Other phosphoric and polyphosphoric acid esters:		
Blend of fatty and phosphate esters	No	MIL.
Glycerol, ethoxylated and phosphated	No	(2).
Glycerol monoester of mixed fatty acids, phosphated	No	WTC.
Polyoxyalkylate(fatty alcohol), phosphate ester	No	BAS.
Stearyl amine polyphosphoric acid, ethoxylated	No	GDC.
All other phosphoric and polyphosphoric acid esters	No	ENJ, MOA, WTC.
Sulfonic acids (and salts thereof):		
Alkylbenzenesulfonates:		
Dodecylbenzenesulfonates:		
Dodecylbenzenesulfonic acid	Yes	AAC, EMK, ENJ, JLP, LEV, PIL, PLX, STP, TEN, VST, WTC, (2).
Dodecylbenzenesulfonic acid, ammonium salt	No	CCC, LEV, (2).
Dodecylbenzenesulfonic acid, calcium salt	Yes	HCL, ICI, RH, STP, TMH, WTC, (2).
Dodecylbenzenesulfonic acid, diethanolamine salt	No	AAC.
Dodecylbenzenesulfonic acid, ethylenediamine salt	No	TCH.
Dodecylbenzenesulfonic acid, isopropanolamine salt	No	PIL, (2).
Dodecylbenzenesulfonic acid, isopropylamine salt	Yes	CIN, ICI, KPI, PPG, STP, TCH, WTC, (2).
Dodecylbenzenesulfonic acid, (mixed alkyl)amine salt	Yes	ECC, FTX, HCL, HIP, (2).
Dodecylbenzenesulfonic acid, monoethanolamine salt	No	AAC, RPC.
Dodecylbenzenesulfonic acid, oleyl amine, ethoxylated, salt	No	HCL.
Dodecylbenzenesulfonic acid, potassium salt	No	BRI, GDC, MRV.

See footnotes at end of table.

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Surface-active agents	*Separate statistics* [1]	*Manufacturers' identification codes (according to list in table 38)*
Anionic—Continued		
Sulfonic acids (and salts thereof)—Continued		
Alkylbenzenesulfonates—Continued		
Dodecylbenzenesulfonates—Continued		
Dodecylbenzenesulfonic acid, sodium salt	Yes	AAC, APC, BLA, BOE, BRI, CP, CPC, CRT, CTL, DOW, DUP, ECC, JLP, LEV, NMC, PCI, PG, PIL, PLX, PNX, STP, TEN, VKR, VST, WTC.
Dodecylbenzenesulfonic acid, triethanolamine salt	Yes	AAC, BRD, BRI, CCC, CPC, CTL, ESS, FTX, MRV, PCI, PIL, STP, WTC.
All other dodecylbenzene sulfonates	No	ENJ.
Other alkylbenzenesulfonates:		
Benzene sulfonic acid	No	WTC.
Neoalkoxy, dodecylbenzene-sulfonyl titanate	No	KPI.
Tridecylbenzenesulfonic acid	No	CP, PLX.
Tridecylbenzenesulfonic acid, sodium salt	No	BLA, CMT, CPC, NPR, PG.
Benzene-, cumene-, toluene-, and xylenesulfonates:		
Cumenesulfonic acid, ammonium salt	No	NES, SCP.
Cumenesulfonic acid, sodium salt	No	NES, STP, WTC.
Toluenesulfonic acid, potassium salt	No	NES.
Toluenesulfonic acid, sodium salt	No	NES, PG, VST.
Toluene xylene sulfonic acid	No	WTC.
Xylenesulfonic acid, ammonium salt	No	NES, PG, STP, WTC.
Xylenesulfonic acid, sodium salt	No	AAC, ICI, NES, PIL, SHC, STP, WTC.
All other benzene-, cumene-, toluene-, and xylenesulfonates	No	SCP.
Lignin sulfonates:		
Lignin sulfonic acid, ammonium salt	Yes	MAR, PSP, RAY, SPA.
Lignin sulfonic acid, calcium salt	Yes	FPC, LKY, MAR, PSP.
Lignin sulfonic acid, chromium salt	No	MAR, PSP, RAY.
Lignin sulfonic acid, iron salt	No	MAR, PSP.
Lignin sulfonic acid, magnesium salt	No	MAR, RAY.
Lignin sulfonic acid, mixed chromium and iron salts	No	PSP.
Lignin sulfonic acid, potassium salt	No	PSP.
Lignin sulfonic acid, sodium salt	Yes	MAR, PSP, WVA.
Lignin sulfonic acid, zinc salt	No	ENJ, MAR, PSP.
All other lignin sulfates,	No	MAR.
Naphthalenesulfonates:		
Butylnaphthalenesulfonic acid, sodium salt	No	ECC, UDI.
Di(C_5-C_6 alkyl)naphthalenesulfonic acid	No	([2]).
Dibutylnaphthalenesulfonic acid	No	GAF, UDI.
Diisopropylnaphthalenesulfonic acid, sodium salt	Yes	DUP, SCP, UDI.
Isopropylnaphthalenesulfonic acid	No	UDI.
Methylnaphthalenesulfonic acid, sodium salt	No	CPC, UDI.
Methylnonylnaphthalenesulfonic acid, sodium salt	No	UDI.
Naphthalenesulfonic acid, sodium salt, formaldehyde condensate	No	ICI, UDI.
All other naphthalenesulfonates	No	HAL, TCH.
Sulfonic acids having amide linkages:		
Sulfosuccinamic acid derivatives:		
N-(1,2-Dicarboxyethyl)-N-octadecylsulfosuccinamic acid, tetrasodium salt	No	ACY, MOA.
N-Octadecylsulfosuccinamic acid, disodium salt	No	ACY.
Oleamidosulfosuccinamic acid, disodium salt	No	SBC.
N-(Oleoyloxyisopropyl)sulfosuccinamic acid	No	WTC.

See footnotes at end of table.

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Surface-active agents	Separate statistics [1]	Manufacturers' identification codes (according to list in table 38)
Anionic—Continued		
Sulfonic acids (and salts thereof)—Continued		
Sulfonic acids having amide linkages—Continued		
Taurine derivatives:		
N-(Coconut oil acyl)-N-methyltaurine, sodium salt	No	FTX, GAF.
N-Cyclohexyl-N-palmitoyltaurine, sodium salt	No	GAF.
N-Methyl-N-oleoyltaurine, sodium salt	No	CPC, FTX, GAF, HCL.
N-Methyl-N-palmitoyltaurine, sodium salt	No	GAF.
N-Methyl-N-(tall oil acyl)taurine, sodium salt	No	CCC, GAF, WVA.
All other sulfonic acids having amide linkages	No	HCL.
Sulfonic acids having ester or ether linkages:		
Sulfosuccinic acid esters:		
Sulfosuccinic acid, bis(diisobutyl)ester, amidodisodium salt	No	MOA.
Sulfosuccinic acid, bis(2,6-dimethyl-4-heptyl)-ester, sodium salt	No	MOA, NSC.
Sulfosuccinic acid, bis(2-ethylhexyl)ester, sodium salt	Yes	AAC, ACY, AMU, APX, BRI, CCC, CHP, CRT, ECC, EMK, ENJ, FTX, HCL, HDG, MCP, MOA, MRV, RH, RPC, WTC.
Sulfosuccinic acid, dihexyl ester, sodium salt	No	ACY, FTX, MOA.
Sulfosuccinic acid, diisobutyl ester, sodium salt	No	FTX.
Sulfosuccinic acid, diisodecyl ester, sodium salt	No	ACY.
Sulfosuccinic acid, diisooctyl ester, sodium salt	No	ARI, SOS.
Sulfosuccinic acid, dioctyl ester, sodium salt	No	MOA.
Sulfosuccinic acid, dipentyl ester, sodium salt	No	ACY.
Sulfosuccinic acid, ditridecyl ester, sodium salt	No	ACY, MOA.
Sulfosuccinic acid, (lauryl polyethylene glycol ether) ester, disodium salt	No	SHX.
Sulfosuccinic acid, (coconut oil alkyl)-iminoisopropanol half-ester, sodium salt	No	MOA.
Sulfosuccinic acid, lanolin ester, disodium salt	No	AAC.
Sulfosuccinic acid, lauramidomonoethanolamine, disodium salt	No	AAC.
Sulfosuccinic acid, monolaureth ester, disodium salt	Yes	AAC, MIR, MOA.
Sulfosuccinic acid, monooleamidopolyethyleneglycol ester, disodium salt	No	SCP.
Sulfosuccinic acid, myristyl ester, disodium monoethanolamine salt	No	WTC.
Sulfosuccinic acid, oleamidopolyethyleneglycol, disodium salt	No	MOA.
Sulfosuccinic acid, ricinoleamide monoethanolamine disodium salt	No	AAC.
All other sulfosuccinic acid esters	No	MOA, SHX, WTC.
All other sulfonic acids having ester or linkages:		
Coconut oil acids, 2-sulfoethyl ester, sodium salt	No	FTX, GAF, HDG, LEV, PPG.
Dodecyldiphenyloxidedisulfonic acid	No	([2]).
Dodecyldiphenyloxidedisulfonic acid, disodium salt	No	CTL.
Dodecyl sulfoacetate, sodium salt	No	STP.
Glycerol monostearate sulfoacetate, sodium salt	No	WTC.
Hexyloxypropanesulfonic acid, sodium salt	No	WTC.
2-Hydroxy, 3-(lauryl-myristyl)(oxy-1 propane sulfonic acid), sodium salt	No	PG.

See footnotes at end of table.

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Surface-active agents	*Separate statistics* [1]	*Manufacturers' identification codes (according to list in table 38)*
Anionic—Continued		
Sulfonic acids (and salts thereof)—Continued		
Sulfonic acids having ester or ether linkages—Continued		
All other sulfonic acids having ester or linkages:—Cont.		
Iso-octyphenol, ethoxylated and sulfonated, sodium salt	No	GAF, RH.
Petroleumsulfonic acid, calcium salt	No	WTC.
All other sulfonic acids with ether linkages	No	PG.
Other sulfonic acids:		
Allyl sulfonate, sodium salt	No	ARD.
Diphenylsulfone sulfonic acid, potassium salt	No	UPF.
Mixed alkanesulfonic acid	No	(2).
Mixed alkane sulfonic acid, sodium salt	No	AAC, DUP, PPG, S, SLM, WTC, WVA, (2).
Mixed linear olefin sulfonate	No	STP.
n-Octanesulfonic acid, sodium salt	No	(2).
Petroleumsulfonic acid, water soluble (acid layer), sodium salt	No	PIL.
All other sulfonic acids	No	CGY, CLU, HAL.
Sulfuric acid esters (and salts thereof):		
Acids, amides, and esters, sulfated:		
Coconut oil acids-ethanolamine salt, sulfated, potassium salt	No	EMK, ENJ.
Mixed alkyl phenol sulfate, ethoxylated, triethanolamine salt	No	MIL.
Carboxylic acid esters (except natural fats and oils), sulfated:		
Esters of sulfated oleic acid:		
Butyl oleate, sulfated, sodium salt	Yes	HIP, ICI, LUR, MCP, MRV, NSC.
Isopropyl oleate, sulfated, sodium salt	No	DEX.
Methyl oleate, sulfated, sodium salt	No	ICI.
Oleic acid, sulfated	No	ACT.
Oleic acid, sulfated, disodium salt	No	MCP.
Oleic acid, sulfated, sodium salt	No	ACY, CIN.
Propyl oleate, sulfated, sodium salt	No	MRV.
Other sulfated esters:		
Glycerol monoester of coconut oil acids, sulfated, sodium salt	No	CP.
9-Octadecenyl acetate, sulfated, sodium salt	No	DUP.
Tall oil acids, oxobottom ester, sulfated, sodium salt	No	LUR.
Tall oil acids, sulfated, sodium salt	No	ICI.
Alcohols, sulfated:		
Decyl sulfate, sodium salt	Yes	ARI, SCP, WTC.
Dodecyl sulfate salts:		
Dodecyl sulfate, ammonium salt	Yes	AAC, BRD, LEV, STP, TNI, WTC, (2).
Dodecyl sulfate, diethanolamine salt	No	BRD, DUP, JRG, STP.
Dodecyl sulfate, N,N-diethylcyclohexylamine salt	No	DUP.
Dodecyl sulfate, isopropanolamine salt	No	JRG.
Dodecyl sulfate, magnesium salt	Yes	AAC, BRD, PG, STP.
Dodecyl sulfate, potassium salt	No	PG.
Dodecyl sulfate, sodium salt	Yes	AAC, BRD, DUP, STP, WTC.
Dodecyl sulfate, triethanolamine salt	Yes	AAC, BRD, STP, TNI.
3,9-Diethyl-6-tridecyl sulfate, sodium salt	No	NCC, SCP.
2-Ethylhexyl sulfate, sodium salt	Yes	AAC, BRD, NCC, PCI, WTC.
7-Ethyl-2-methyl-4-undecyl sulfate, sodium salt	No	NCC.
Hexadecyl sulfate, sodium salt	No	AAC, MIL, SCP.
Mixed linear alcohols, sulfated, ammonium salt	No	AAC, CP, SCP, WTC, (2).
Mixed linear alcohols sulfated, mixed sodium/cocodiethanolamine salts	No	AAC.
Mixed linear alcohols, sulfated, sodium salt	No	DUP, PG, S, SCP, WTC.
Mixed linear alcohols, sulfated, triethanolamine salt	Yes	AAC, PG, SCP, WTC.

See footnotes at end of table.

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Surface-active agents	*Separate statistics* [1]	*Manufacturers' identification codes (according to list in table 38)*
Anionic—Continued		
Sulfuric acid esters (and salts thereof)—Continued		
Alcohols, sulfated—Continued		
Octyl sulfate, sodium salt	No	AAC, DUP.
Oleyl sulfate, sodium salt	No	DUP.
Oxoalcohol bottoms, sulfated, sodium salt	No	WVA.
Tridecyl sulfate, sodium salt	No	AAC.
All other linear alcohols, sulfated	No	PG.
Ethers, sulfated:		
Alkylphenols, ethoxylated and sulfated:		
(Mixed alkyl)phenol, ethoxylated and sulfated, sodium salt	No	(2).
1-Naphthol, ethoxylated and sulfated, free acid	No	TCH.
Nonylphenol, ethoxylated and sulfated, ammonium salt	No	GAF, RPC, STP.
Nonylphenol, ethoxylated and sulfated, sodium salt	No	GAF, WTC.
Octylphenoxy polyethoxy ethyl sulfate	No	RH.
Dodecyl alcohol, ethoxylated and sulfated, ammonium salt	No	AAC, MOA, STP.
Dodecyl alcohol, ethoxylated and sulfated, sodium salt	Yes	AAC, SCP, STP.
Dodecyl and tetradecyl alcohols, ethoxylated and sulfated, ammonium salt	No	PG, (2).
Isobutanol, ethoxylated and sulfated, ammonium salt	No	(2).
Mixed linear alcohols, ethoxylated and sulfated, ammonium salt	No	AAC, BRD, PG, SCP, SHC, STP, VST, WTC, (2), (2).
Mixed linear alcohols, ethoxylated and sulfated, diethanolamine salt	No	SCP.
Mixed linear alcohols, ethoxylated and sulfated, sodium salt	Yes	AAC, BRD, DUP, GAF, PG, PIL, SCP, SHC, STP, VST, WTC, WVA.
Tridecyl alcohol, ethoxylated and sulfated, sodium salt	No	AAC, BRD.
All other sulfated ethers	No	PG, SHX.
Natural fats and oils, sulfated:		
Castor oil, sulfated, sodium salt	Yes	ACT, ACY, ARI, ARL, CRT, DEX, HIP, ICI, LUR, MRV, S, SCP, SLM, WHW.
Coconut oil, sulfated, sodium salt	No	ACY.
Cod oil, sulfated, sodium salt	No	WHW.
Grease, other than wool, sulfated, sodium salt	No	WHW.
Herring oil, sulfated	No	SLM.
Herring oil, sulfated, sodium salt	No	ARI, SLM, WHW.
Lard, sulfated, sodium salt	No	CIN, CRT, LUR, WHW.
Mixed animal and vegetable oil, sulfated, sodium salt	No	SLM.
Mixed fish oils, sulfated, ammonium salt	No	CIN.
Mixed fish oils, sulfated, sodium salt	No	SLM, WHW.
Mixed vegetable oils, sulfated, sodium salt	No	LUR.
Mixed vegetable oils, sulfated, sodium salt	No	CPC.
Neat's foot oil, sulfated, sodium salt	No	ARI, WHW.
Peanut oil, sulfated, sodium salt	No	ACY, LUR.
Pecan oil, sulfated, sodium salt	No	CRT.
Soybean oil, sulfated, sodium salt	No	ACT, WHW.
Sulfated animal fats and oils, all other	No	WVA.
Sulfated fish and marine fat oils, all other	No	ARI, LUR.
Synthetic fatty alcohol ester, sulfated, sodium salt	No	SLM.

See footnotes at end of table.

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Surface-active agents	*Separate statistics* [1]	*Manufacturers' identification codes (according to list in table 38)*
Anionic—Continued		
Sulfuric acid esters (and salts thereof)—Continued		
Natural fats and oils, sulfated—Continued		
Tall oil, sulfated, ammonia salt	No	CIN.
Tall oil, sulfated, sodium salt	Yes	ACT, ARI, CIN, LUR, WTC.
Tallow, sulfated, sodium salt	Yes	ARI, CCC, LUR, NSC, WHW.
All other natural fats and oils, sulfated	No	TEN.
All other sulfuric acid esters	No	BFP, SCP.
Other anionic surface-active agents:		
Alkylalcohol ethoxylated and carbonated, sodium salt	No	MIL.
Ethoxylated acetic acid, sodium salt	No	S.
Half-phthalic acid ester of tallow alkanolamide/monoglyceride	No	EFH.
Lignin, sodium salt	No	WVA.
Mixed alpha-olefins and vegetable	No	SLM.
Mixed linear alcohols, ethoxylated and carbonated, sodium salt	No	S.
Nonylphenol, ethoxylated and carbonated, sodium salt	No	WTC.
Tridecyl alcohol, ethoxylated and carbonated, sodium salt	No	S.
All other anionic surface-active agents	No	DUP, ENJ, MOA, S, WVA.
Cationic		
Amine oxides and oxygen-containing amines (except those having amide linkages):		
Acyclic:		
3-(C_{12}-C_{15} alkyloxy)-1-propanamine	No	ENJ.
3-(C_{12}-C_{19} alkyloxy)-1-propanamine	No	ENJ.
N-(C_{12}-C_{19} alkyl)oxypropyl trimethylene diamine	No	ENJ.
Bis-(2-hydroxyethyl)isodecyloxypropylamine oxide	No	ENJ.
N,N-Bis(2-hydroxyethyl)octadecylamine	Yes	ARC, PPG, SHX.
N,N-Bis(2-hydroxyethyl)(tallow alkyl)amine	Yes	ARC, ENJ, HCL, PPG, SHX.
tert-Butylbenzylamine	No	HXL.
Cocoamidopropyl dimethyl amine	No	PPG, (2).
(Coconut oil alkyl)amine, ethoxylated	Yes	ARC, ENJ, ETC, ICI, PPG, SHX, SVC, TCH, WTC, (2), (2).
(Coconut oil alkyl)amine, ethoxylated, acetate	No	BRD.
(Coconut oil alkyl)amine, ethoxylated and phosphated	No	(2).
Coconut oil alkyl amine, propoxylated	No	SHX.
Cocoyl amidopropyl dimethylamine oxide	No	SCP.
Diethylenetriamine, alkoxylated	No	(2).
N,N-Dimethyldecylamine oxide	No	(2).
N,N-Dimethyldodecylamine oxide	No	CTL, PG, PPG, SHX, (2).
N,N-Dimethylhexadecylamine oxide	No	ARC, BRD, PG, PPG.
N,N-Dimethyl(mixed alkyl)amine oxide	No	S.
N,N-Dimethyl oleyl amide oxide	No	SCP.
Dimethyltetradecylamine oxide	No	(2).
Di(pyrrolidonylethyl)imine	No	PCI.
Ethylene diamine, ethoxylated	No	KPI.
Hexyloxypropylamine	No	DUP, ENJ.
(Hydrogenated tallow alkyl)amine, ethoxylated	Yes	ARC, ENJ, ETC, SHX, WTC.
N-(2-Hydroxyethyl)-N,N',N'-tris(2-hydroxypropyl)-ethylenediamine	No	(2).
2-Imidazoline-1-(2-aminoethyl)-2-(tall oil alkyl), ethoxylated	No	(2).

See footnotes at end of table.

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Surface-active agents	*Separate statistics* [1]	*Manufacturers' identification codes (according to list in table 38)*
Cationic—Continued		
Amine oxides and oxygen-containing amines (except those having amide linkages)—Continued		
Acyclic—Continued		
Isodecyloxypropylamine	No	ENJ.
Isodecyloxypropylamine, ethoxylated	No	ENJ.
3-(3-Isodecyloxy)propylaminopropyl amine	No	SHX.
N-Isodecyloxypropyl trimethylene diamine	No	ENJ.
Isodicycloxypropyl amine propoxylated acetate	No	SHX.
Isopropoxy-tris(2-ethylenediamino)ethyl titanate	No	KPI.
Isotridecyloxypropylamine	No	ENJ.
N-Isotridecyloxypropyl trimethylene diamine	No	ENJ.
3-(Mixed alkoxy)propylamine, ethoxylated oxides	No	SHX.
3-(3-Mixed alkoxy)propylaminopropyl amine	No	SHX.
(Mixed alkyl)amine, ethoxylated	No	ICI, RH, SHX, (2).
Neoalkoxy, tri(m-amino)-phenyl titanate	No	KPI.
Neoalkoxy, tris(m-amino)-phenyl zirconate	No	KPI.
Neoalkoxy, tris(ethylenediamino)zirconate	No	KPI.
(9-Octadecenyl)amine, ethoxylated	Yes	ETC, GAF, HCL, SHX, TCH, (2).
Octadecylamine, ethoxylated	Yes	ARC, ETC, TCH, WTC.
Octyldimethylamine oxide	No	HNT.
Polyether amine, ethoxylated	No	RH.
Polyethylenepolyamine, alkoxylated	No	BAS.
Polyimine, propoxylated	No	TCH.
1,3-Propanediamine, alkoxylated	No	SHX.
(Soybean oil alkyl)amine, ethoxylated	Yes	ARC, ENJ, ETC, GAF, JTO, PPG, SHX.
(Tallow alkyl)amine, ethoxylated	Yes	ARC, BAS, DUP, ENJ, ETC, GAF, JTO, PPG, S, SHX, TCH, WTC, (2), (2).
N-(Tallow alkyl)trimethylenediamine, ethoxylated	Yes	RC, ENJ, ETC, GAF, JTO, (2).
[Tallow ethyl alkyl]amine, ethoxylated, sulfate	No	ETC, RPC.
N,N,N',N'-Tetrakis(2-hydroxyethyl)ethylenediamine	No	PPG, (2).
N,N,N',N'-Tetrakis(2-Hydroxyethyl)ethylenediamine, propoxylated	No	HCL.
N,N,N',N'-Tetrakis(2-hydroxypropyl)-ethylenediamine, propoxylated and ethoxylated	No	BAS, PPG.
3-(3-Tridecyloxy)propylaminopropyl amine	No	SHX.
Triethanolamine, ethoxylated	No	ETC, MIL, TCH.
Triethanolamine phosphate ester	No	(2).
Triethanolamine salicylate	No	RSA.
All other acyclic amine oxides and oxygen-containing amines (except those with amide linkages)	No	ARC, BAS, HIL, JTO, LUR, PG, SVC, WTC.
Cyclic:		
Aniline, ethoxylated	No	MIL.
2-Butenedioic acid-(ξ)-diamine-1-(2-aminoethyl)-2-(tall oil alkyl)-2-imidazoline condensate	No	(2).
2,5-Dimethoxyaniline, ethoxylated	No	MIL.
2-Heptadecyl-1,4-hydroxymethyl-4-ethyl-2-oxazoline	No	BRD.
N-Hexadecylmorpholine	No	BRD.
N-(2-Hydroxyethyl)-1,2-diphenylethylenediamine	No	MIR.
1-(2-Hydroxyethyl)-2-nonyl-2-imidazoline	Yes	BRD, MIR, MOA, PPG, SHX, WTC.
1-(2-Hydroxyethyl)-2-nor(coconut oil alkyl)-2-imidazoline	No	BRD, FTX, MOA.
1-(2-Hydroxyethyl)-2-nor(soya oil alkyl)-2-imidazoline	No	MIR.
1-(2-Hydroxyethyl)-2-nor(tall oil alkyl)-2-imidazoline	Yes	BRD, HDG, MIR, MOA, (2).
1-(2-Hydroxyethyl)-2-(tall oil alkyl)imidazoline, fatty acid salt	No	(2).

See footnotes at end of table.

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Surface-active agents	Separate statistics [1]	Manufacturers' identification codes (according to list in table 38)
Cationic—Continued		
Amine oxides and oxygen-containing amines (except those having amide linkages)—Continued		
Cyclic—Continued		
Lignin amine	No	WVA.
Rosin amine, ethoxylated	No	HPC, (2).
m-Toluidine, ethoxylated	No	MIL.
All other cyclic amine oxides and oxygen-containing amines (except those having amine linkages)	No	(2).
Amines and amine oxides having amide linkages:		
Carboxylic acid - diamine and polyamine condensates:		
Acetic acid, amides with polyalkylene polyamines, salt	No	(2).
All other carboxylic acid-diamine and polyamine condensates	No	ARI, ICI, MOA.
Mixed fatty acids-polyalkylenepolyamine condensate	No	TCH.
Naphthenic acids-polyalkylene polyamine condensate	No	(2).
Naphthenic acids-tall oil fatty acids-polyalkylene polyamine condensate	No	(2).
2-Nor-tall oil alkyl-1-tall oil amido-ethyl imidazoline	No	SHX.
Oleic acid-diethylenetriamine condensate	No	ICI.
Oleic acid-N,N-dimethyltrimethylenediamine condensate	No	CCW.
Pelargonic acid-tetraethylenepentamine condensate	No	ETC, HCL, ICI, OC.
Stearic acid-diethylenetriamine condensate	No	ARC, ARI, CRT, OC, PPG, SCP, SQA.
Stearic acid-diethylenetriamine condensate, ethyl sulfate	No	GDC.
Stearic acid-N,N-diethylethylenediamine condensate	No	S.
Stearic acid-ethylenediamine condensate	No	CLD, SOS.
Stearic acid mixed amine condensate	No	HCL.
Stearic acid-tetraethylenepentamine condensate	No	(2).
Tall oil acids/aminoethylpiperazine condensate	No	ENJ.
Tall oil acids-diethylenetriamine condensate	No	WTC, WVA.
Tall oil acids-polyalkylenepolyamine condensate	No	FER, WVA, (2).
Tall oil acids-polyalkylene polyamine condensate, salts, with dodecylbenzenesulfonic acid and/or tall oil fatty acids	No	(2).
Tallow fatty acids-aminoethylethanolamine condensates	No	OC.
Carboxylic acid - diamine and polyamine condensates, alkoxylated:		
Mixed fatty acids-alkylenediamine condensate, polyethoxylate	No	SHX, WTC.
Palm oil acids-ethylenediamine condesate, monoethoxylated	No	FTX.
Stearic acid-ethylenediamine condensate, monoethoxylated	No	DEX, ENJ, GDC, ICI, SLC.
Stearic acid-ethylenediamine condensate, polyethoxylated	No	APC.
All other carboxylic acid - diamine and polyamine condensates alkoxylated	No	SCP.
Other amines and amine oxides having amide linkages:		
3-Cocoamido-N,N-dimethyl propylamine oxide	No	PPG.
Cocoamidopropyl dimethyl amine oxide	No	AAC, PAT, SBC.
N,N'-(Di-tall oil acid)amidoethylamine	No	(2).

See footnotes at end of table.

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Surface-active agents	Separate statistics [1]	Manufacturers' identification codes (according to list in table 38)
Cationic—Continued		
Amines and amine oxides having amide linkages:		
Other amines and amine oxides having amide linkages —Continued		
1-(2-Hydrogenated tallow amidoethyl)-2-nor(hydrogenated tallow)-2-imidazoline	No	SHX.
3-Lauramido-N,N-dimethylpropylamine oxide	No	FTX, SQA.
Oleamidopropyldimethyl amine	No	WM.
Stearamidoethyldiethylamine	No	S.
Stearamidoethylethanolamine acetate	No	S.
Stearic acid, diethanolamine condensate, methyl sulfate	No	DUP.
Stearylamidopropyldimethyl amine	No	AAC, WM.
Amines, not containing oxygen (and salts thereof):		
Amine salts:		
N,N-Dimethyl-N-alkylamine phosphate	No	(2).
(Hydrogenated tallow alkyl)amine acetate	No	ARC.
(Mixed alkyl)amine phosphate	No	(2).
Octadecylamine acetate	No	ARC, HCL.
(Tallow alkyl)amine acetate	No	ARC, (2).
N-(Tallow alkyl)trimethylenediamine acetate	No	ARC.
All other amine salts (not containing oxygen)	No	SHX.
Diamines and polyamines:		
Imidazoline derivatives:		
1-(2-Aminoethyl)-2-naphthenyl-2-imidazoline	No	(2).
1-(2-Aminoethyl)-2-nor(tall oil alkyl)-2-imidazoline	No	WTC, (2).
N-(Coconut oil alkyl)trimethylenediamine	No	ARC, JTO, SHX.
N-(Dimeracidalkyl)trimethylenediamine	No	ENO.
N-(Docosyl and eicosyl)trimethylenediamine	No	ENO.
2-Heptadecyl-2-imidazoline	No	CGY, SCO.
N-(Mixed alkyl)polyethylenepolyamine	No	CCW.
N-(9-Octadecenyl)trimethylenediamine	No	ARC, JTO, SHX.
Polyalicyclene polyamines and salts and quats	No	(2).
Polyamine/tall oil imidazoline	No	WTC.
1-Propanamine, 3-(C_{12}-C_{15} alkoxy derivatives)	No	SHX.
N-(Soybean oil alkyl)trimethylenediamine	No	ENO.
Stearamidoethyl-2-heptadecyl imidazoline	No	ICI.
3-(Tall oil amino)propyl amine	No	SHX.
N-(Tallow alkyl)dipropylenetriamine	No	ENJ, SHX.
N-(Tallow alkyl)trimethylenediamine	No	ARC, ENJ, JTO.
All other diamines and polyamines	No	ARC, JTO, SHX, (2).
Primary monoamines:		
Alkyl dimethyl amine oxide	No	HCL.
Arachidylbehenylalkyl amine	No	ENO.
(Coconut oil alkyl)amine	No	ARC, ENO, SHX, WTC.
Dimeracidalkyl amine	No	ENO, WTC.
Dodecylamine	No	ARC, SHX.
[Erucyl alkyl]amine	No	ENO.
Hexadecylamine	No	ARC, ENO, WTC.
(Hydrogenated tallow alkyl)amine	Yes	ARC, ENJ, ENO, JTO, SHX, WTC.
(Mixed alkyl)amine	No	JTO, SHX, WTC.
9-Octadecenylamine	Yes	ARC, ENO, JTO, SHX, WTC.
Octadecylamine	No	ENO, SHX, WTC.
(Soybean oil alkyl)amine	Yes	ARC, ENO, JTO.
(Tallow alkyl)amine	No	ARC, ENJ, ENO, JTO, SHX, WTC.
All other primary monoamines	No	ARC.

See footnotes at end of table.

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Surface-active agents	*Separate statistics* [1]	*Manufacturers' identification codes (according to list in table 38)*
Cationic—Continued		
Amines, not containing oxygen (and salts thereof)—Cont.		
Secondary and tertiary monoamines:		
Bis(coconut oil alkyl)amine	No	ARC.
Bis(hydrogenated tallow alkyl)amine	No	ARC.
1-Decanamine, N,N-didodecyl	No	SHX.
N,N-Dimethylbemenylarachidyl amine	No	WTC.
N,N-Dimethyl(coconut oil alkyl)amine	No	ARC, PG.
N,N-Dimethyldodecylamine	No	ARC, SHX, TNA, WTC.
N,N-Dimethylhexadecylamine	No	ARC, SHX.
N,N-Dimethyl(hydrogenated tallow alkyl)amine	No	ARC, CPC.
N,N-Dimethyl(mixed alkyl)amine	No	BRD, JTO, SHX.
N,N-Dimethyl(9-octadecenyl-alkyl)amine	No	ENO.
N,N-Dimethyloctadecylamine	No	ARC, ENO, SHX, WTC.
N,N-Dimethyl(soybean oil alkyl)amine	No	ARC, JTO, WTC.
N,N-Dimethyl(tallow alkyl)amine	No	ENO.
N,N-Dimethyltetradecylamine	No	BRD, SHX.
N-Methylbis(coconut oil alkyl)amine	No	ARC, SHX.
N-Methylbis(hydrogenated tallow alkyl)amine	No	ARC, ENO, SHX, WTC.
Methyl didecylamine	No	TNA.
N-Methyldioctadecylamine	No	ARC, SHX.
Triisodecylamine	No	SCP.
Trilaurylamine	No	SCP.
Tri(mixed alkyl)amine	No	SHX.
Trioctylamine	No	SCP, SHX.
Tri(tridecyl)amine	No	SHX.
All other secondary and tertiary monoamines	No	ARC, ENO, SHX.
Oxygen-containing quaternary ammonium salts:		
β-Alanine-N-(2-hydroxyethyl)-N-2,1-[[oxococoyl] amino] ethyl, sodium salt	No	SHX.
2-(C_{13}-C_{17}-Alkyl)-1-(C_{14}-C_{18}-amidoethyl)(4,5-dihydro-3-methyl)imidazolinium, methyl sulfate	No	DOW, SVC.
(2-Aminoethyl)ethyl(hydrogenated tallow alkyl)(2-hydroxyethyl)ammonium ethyl sulfate	No	OC.
Benzyl(polyoxyethylene octadecylamine)ammonium chloride with benzyl(polyoxyethylene tallowamine) ammonium chloride	No	S.
Benzyl(coconut oil alkyl)bis(2-hydroxyethyl)-ammonium chloride	No	ARC, (2).
1-Benzyl-1-(2-hydroxyethyl)-2-nor(tall oil alkyl)-2-imidazoline	No	SHX, (2).
Benzyl(tallow alkyl)bis(2-hydroxyethyl)ammonium chloride	No	DUP.
Bis(N-amidopropyl)-N,N-dimethyl-N-ethylammonium ethyl sulfate, dimer acid	No	SBC.
Bis(N,N'-ethyl(stearic/arachidic/behenic)amide)-cyanoethyl ethylammonium ethosulfate	No	PCI.
Bis(2-hydroxyethyl, ethoxylated)-methyloctadecylammonium chloride	No	SHX.
Bis-2-hydroxyethyl-hydrogenated tallow-ethyl sulfate	No	ICI.
Bis-2-hydroxyethyl-octyl-methyl-p-toluene sulfonate	No	HXL.
(Coconut oil alkyl)bis(2-hydroxyethyl, ethoxylated)-methylammonium chloride	Yes	ENJ, GAF, SHX.
(Coconut oil alkyl)-bis-(hydroxyethyl)methyl ethoxylated mono-(2-carboxyethyl)ether methyl sulfate, potassium salt	No	SVC.
Coconut oil fatty acid polyoxyethylene	No	S.

See footnotes at end of table.

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Surface-active agents	Separate statistics [1]	Manufacturers' identification codes (according to list in table 38)
Cationic—Continued		
Oxygen-containing quaternary ammonium salts—Continued		
Dimethyl dodecyl ethyl ammonium ether sulfate	No	PCI.
Distearyldimethyl ammonium methosulfate	No	HXL.
Ethanaminium, 2-hydroxy-N,N-bis(2-hydroxyethyl)-N-methyl-, salt with silicic acid	No	TCH.
Ethoxylated(hydrogenated tallow amine), methyl ammonium chloride	No	ENJ.
Ethoxylated, quaternized reaction product of formaldehyde and tallow diamine	No	ENJ.
Ethoxylated tallow amine, potassium propionate derivative	No	SVC.
N-Ethyl-N,N-bis(polyoxyethylene)tallow ammonium ethyl sulfate	No	SHX.
1-Ethyl-2-(8-heptadecenyl)-1-(2-hydroxyethyl)-2-imidazolinium ethyl sulfate	No	ICI, SHX.
N-Ethyl-N-hexadecylmorpholinium ethyl sulfate	No	BRD, ICI.
Ethyl(polyoxyethylene, cocoamine) ethylsulfate	No	S.
N-Ethyl-N-(soybean oil alkyl)morpholinium ethyl sulfate	No	ICI, PCH.
α-Gluconamidopropyl dimethy-2-hydroxyethyl ammonium chloride	No	VND.
(2-Hydroxyethyl)dimethyl(3-stearamidopropyl)-ammonium dihydrogen phosphate	No	ACY.
(2-Hydroxyethyl)dimethyl(3-stearamidopropyl)-ammonium nitrate	No	ACY.
Hydroxyethyl-2-undecyl-2,3-imidazoline	No	MOA.
N-2-hydroxy propyl-n-methyl-N,n-bistallow amide ethyl ammonium ethyl sulfate	No	SHX.
Imidazolinium, 1-carboxymethyl)-4,5-dihydro-1-(hydroxyethyl)-2-nor(cocoalkyl), hydroxides, monosodium salts	No	SHX.
Imidazolinium, 1-(carboxymethyl)-2-heptyl-1-(2-hydroxyethyl), hydroxide, sodium salt	No	SHX.
Isostearamidopropyl dimethylamino glycolate	No	SBC.
(3-Lauramidopropyl)trimethylammonium methyl sulfate	No	ACY.
Methyl, bis-(2-hydroxyethyl) isodecyloxypropylammonium chloride	No	ENJ.
Methyl, bis-(2-hydroxyethyl) isotridecyloxypropylammonium chloride	No	ENJ.
Methyl, bis-(2-hydroxyethyl) soyaalkylammonium chloride	No	ENJ.
Methyl dioleyl ethoxy ammonium methyl sulfate	No	SHX.
Methyl-ditallowimidazolinium methosulfate	No	SVC.
1-Methyl-2-(8-heptadecenyl)-1-(9-octadecenyl) amido ethyl	No	SHX.
N-Methyl-N-polyoxyethylene-N,N-bis(hydrogenated tallow amidoethyl)ammonium	No	SHX.
N-Methyl-N-polyoxyethylene-N,N-bis(tallow amidoethyl)	No	SHX.
Methyltallowdiethylenetriamine condensate, polyethoxylated,methyl sulfate	No	SVC.
Methyltallowdiethylenetriamine condensate, polypropoxylated, methyl sulfate	No	SVC.
Mixed alkyl imidazoline derivative, ethoxylated	No	MOA.
Mixed(coco and soya fatty acids), reaction products with chloromethane and diethylenetriamine, ethoxylated, quaternized	No	ENJ.

See footnotes at end of table.

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Surface-active agents	*Separate statistics* [1]	*Manufacturers' identification codes (according to list in table 38)*
Cationic—Continued		
Oxygen-containing quaternary ammonium salts—Continued		
Mixed fatty acid amide with diethylene triamine/ethyl sulfate	No	EFH.
N-Octadecyl-N,N-di(2-hydroxyethyl)-N-methylammonium chloride	No	SHX.
Polyethyleneimine methyl ammonium sulfate	No	HCL.
Polypropoxy diethylmethyl ammonium chloride	No	WTC.
1-Propanaminium, N-ethyl-N,N-dimethyl-3-(1-oxooctadecyl)amino-, ethyl sulfate	No	SBC.
Soya fatty acids, reaction products with chloromethame and diethylenetriamine, ethoxylated, quaternized	No	ENJ.
Soya fatty acids, reaction products with chloromethane and diethylenetriamine, propoxylated, quaternized	No	ENJ.
Stearamidopropyldimethylceterylammonium tosylate and propylene glycol	No	VND.
Stearylamidopropyl dimethyl myristyl acetate ammonium chloride	No	VND.
(Tallow alkyl)amine, ethoxylated, diethosulfate	No	ETC.
(Tallow alkyl)-bis-(2-hydroxyethyl)methylammonium chloride	No	JTO.
Tallow amine, ethoxylated, quarternary ammonium salt	No	DUP, VND.
Tetra Butyl ammonium hydrogen sulfate	No	HXL.
All other oxygen-containing quaternary ammonium salts (except those having amide linkages)	No	ARC, PPG, SBC, SCP, SHX, ([2]).
All other oxygen-containing quaternary ammonium salts	No	BRD, GAF, PPG.
Quaternary ammonium salts, not containing oxygen:		
Acyclic:		
Bis(coconut oil alkyl)dimethylammonium chloride	Yes	ARC, ENJ, JTO, SHX.
Bis(hydrogenated tallow alkyl)dimethylammonium chloride	Yes	ARC, ENO, SHX, WTC.
Bis(hydrogenated tallow alkyl)-dimethylammoniummethyl sulfate	No	ARC, SHX.
Bis(tallow alkyl)dimethylammonium chloride	No	SHX.
N-(Cocoamidopropyl-N,N-acetic acid) ammonium salt	No	([2]).
Cocodimethyl ethyl ammonium ethyl sulfate	No	SHX.
N-[(Coconut oil alkyl)amino]butyric acid, sodium salt	Yes	ARC, BRD, HNT, JTO, PPG, SHX.
Dicocodimethyl ammonium methyl sulfate	No	HXL.
Didecyldimethylammonium chloride	No	ARC.
Dimethyldi(C_{12}-C_{18})ammonium chloride (mixed straight and branched chains)	No	SHX.
Dimethyldioctadecylammonium choride	No	ARC, SHX.
Dimethyl(soya alkyl)ammonium ethyl sulfate	No	SVC.
N,N-Dioctyl-N,N-dimethyl ammonium chloride	No	BRD, HNT.
Ditallowamidoammonium sulfate	No	CRD.
Dodecyltrimethylammonium chloride	No	ARC, SHX.
Ethyldimethyl(mixed alkyl)ammonium ethyl sulfate	No	DEX, PPG.
Ethylhexadecyldimethylammonium bromide	No	HXL.
Hexadecyltrimethylammonium bromide	Yes	AAC, ARC, HXL.
Hexadecyltrimethylammonium chloride	No	AAC, ARC, BRD, SHX.
Hexane-1,6-bis(tributyl ammonium bromide)	No	HXL.
(Hydrogenated tallow alkyl)trimethylammonium chloride	No	SHX.
Hydroxypropyl ammonium cyano acetate	No	([2]).

See footnotes at end of table.

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Surface-active agents	Separate statistics [1]	Manufacturers' identification codes (according to list in table 38)
Cationic—Continued		
Quaternary ammonium salts, not containing oxygen—Continued		
Acyclic—Continued		
Lauryl pyridinium chloride	No	WTC.
Methyl (tri-hydrogenated tallow alkyl) ammonium chloride	No	WTC.
Methyl-1-tallowamidoethyl-2-tallowimidazolium-methyl sulfate	No	CRD.
Methyl tri(C_8-C_{10}) ammonium chloride	No	SHX.
Methyltrioctylammonium chloride	No	SCP.
(Mixed alkyl) ammonium chloride	No	MIL.
(Mixed linear alkyl) dimethyl ammonium methyl sulfate	No	HCL.
Mixture of N-octyl, N-decyl, N,N-dimethyl ammonium chloride and benzyl, dimethyl, (mixed alkyl) ammonium chloride	No	BRD.
Octyl decyl dimethyl ammonium chloride	No	HNT.
N-Octyl, N-decyl, N,N-dimethyl ammonium chloride	No	BRD.
N,N,N',N',N'-Pentamethyl-N-(tallow alkyl)-trimethylene-bisammonium chloride	No	ARC, SHX.
Stearic acid ethylene diamine methyl ammonium sulfate	No	HCL.
Stearyl pyridium chloride	No	WTC.
Tetrabutylammonium bromide	No	HXL, RSA.
1-Tetradecanaminium,N,N,N-trimethyl-chloride	No	SHX.
Tetraethylammonium bromide	No	EK.
Tetraethyl ammonium chloride	No	RSA.
Tetraheptyl ammonium bromide	No	EK.
Tetra methyl ammonium bromide	No	RSA.
Tetramethylammonium chloride	No	RSA.
Tributylmethylammonium chloride	No	TNA.
Trihydrogenated tallow ammonium chloride	No	ENO.
Trimethyl(mixed alkyl) ammonium chloride	No	WTC.
Trimethyloctadecylammonium chloride	No	ARC, SHX, SVC.
Trimethyl(soybean oil alkyl) ammonium chloride	No	ARC, JTO, SHX.
Trimethyl(tallow alkyl) ammonium chloride	Yes	ARC, ENO, JTO, SHX, WTC.
Trimethyltetradecylammonium bromide	No	AAC, HXL.
All other acyclic quaternary ammonium salts, not containing oxygen	No	AAC, ARC, MOA, PCI, PPG, RSA, SHX, (2), (2).
Cyclic:		
Benzyl(alkylpyridinium) chloride	No	(2).
Benzyl(cocoamidopropyl) dimethyl ammonium chloride	No	(2).
Benzyl(coconut oil alkyl) dimethylammonium chloride	No	ENO, GDC, HRT, LUR, TCC, WTC, (2).
Benzyl-di(hydrogenated tallow alkyl)-methylammonium chloride	No	ENO.
Benzyldimethyl(mixed alkyl) ammonium chloride	Yes	BKM, BRD, CRD, HIL, HNT, PCI, PPG, SHX, (2), (2).
Benzyldimethyloctadecylammonium chloride	Yes	AAC, PPG, SHX, TNI.
Benzyldimethyl(tallow alkyl) ammonium chloride	No	BOE, ENO, WTC.
Benzylhexadecyldimethylammonium chloride	No	BKM.
Benzyl(hydrogenated tallow alkyl) dimethylammonium chloride	No	ARC, ENO, SHX, WTC.
Benzyl-methyl-bis(hydrogenated tallow) ammonium chloride	No	ENO.
Benzyl(mixed alkyl) pyridinium chloride	No	(2).
Benzyl picolinium chloride	No	GDC.
1-Benzylpyridinium chloride	No	BRD, HIP.

See footnotes at end of table.

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Surface-active agents	*Separate statistics* [1]	*Manufacturers' identification codes (according to list in table 38)*
Cationic—Continued		
Quaternary ammonium salts, not containing oxygen—Cont.		
Cyclic—Continued		
1-Benzylquinolinium chloride	No	(2).
Benzyltrimethylammonium chloride	Yes	CRT, PCI, RSA, SHX, TCC, UTC.
Butylpicolinium bromide	No	HXL.
2,4-Dichlorobenzyldimethyl(mixed alkyl)ammonium chloride	No	(2).
1-Dodecylpyridinium chloride	No	DAN.
(Ethylbenzyl)dimethyl(mixed alkyl)ammonium chloride	No	HNT.
(Mixed alkyl)dibenzyltrimethyl-1,3-propane diammonium chloride	No	GDC.
1-Phenethyl-2-picolinium bromide	No	HXL.
All other cyclic quaternary ammonium salts not containing oxygen	No	ICI, JTO, (2), (2).
All other cationic surface-active agents	No	AAC, BRD, BRI, CGY, DUP, JTO, MIR, MOA, PPG, RPC, TCH, WM, WTC.
Nonionic		
Carboxylic acid amides:		
Diethanolamine condensates (Amine/acid ratio = 2/1):		
Capric acid (Ratio = 2/1)	No	SCP.
Castor oil acids (Ratio = 2/1)	No	AAC, MCP, NSC, TCH.
Coconut oil acids (Ratio = 2/1)	Yes	AAC, ARD, BRI, CCC, CCL, CON, CTL, ECC, EFH, FTX, GAF, GDC, HNT, HRT, MOA, PNX, PPG, REZ, SBC, SCP, SHX, STP, WTC.
Coconut oil and tallow acids (Ratio = 2/1)	Yes	BRD, ENJ, ESS, MOA, SBC, UNN.
Lard oil acids	No	FER.
Lauric acid (Ratio = 2/1)	No	CRD, MOA.
Lauric and myristic acids (Ratio = 2/1)	Yes	CRD, FTX, MOA, PPG, SBC, STP.
Linoleic acid (Ratio = 2/1)	No	MOA.
Mixed carboxylic acids	No	FER, RPC, SOS.
Mixed fatty acids, neutralized	No	CPC, FTX.
Oleic acid (Ratio = 2/1)	Yes	AAC, CTL, EFH, GAF, MOA, PPG, SBC, STP.
Palmitic and stearic acids (Ratio = 2/1)	No	RPC.
Pelargonic acid (Ratio = 2/1)	No	TCH.
Stearic acid (Ratio = 2/1)	Yes	AAC, EFH, OC.
Tall oil acids (Ratio = 2/1)	Yes	BRI, ECC, HCL, MOA, PNX, PPG, SBC, WVA.
Tallow acids (Ratio = 2/1)	No	EFH, ICI, MOA.
All other diethanolamine condensates (Amine/acid = 2/1)	No	MOA, SHX.
Diethanolamine condensates, other amine/acid ratios:		
Capric acid (Ratio = 1/1)	No	MOA.
Coconut oil acids (Ratio = 1/1)	Yes	AAC, ARD, BRD, CTL, EMK, ETC, FTX, GAF, HNT, HRT, HTN, JRG, MIR, MOA, PIL, PPG, SBC, SCP, SHX, STP, TCC, VND, WTC, (2).
Lauric acid (Ratio = 1/1)	Yes	AAC, HTN, MOA, SBC, TNI, WTC.
Lauric and myristic acid (Ratio = 1/1)	Yes	AAC, BRD, FTX, MOA, SBC.
Linoleic acid (Ratio = 1/1)	Yes	ARD, MOA, SBC, VND.
Mixed carboxylic acids (Ratio = 1/1)	No	SOS, WTC.
Mixed fatty acids (Ratio = 1.1)	No	WTC.
Myristic acid (Ratio = 1/1)	No	MOA.
Oleic acid (Ratio = 1/1)	No	AAC, SBC.
Palm kernel oil acids (Ratio = 1/1)	No	TMH.
Rapeseed acids (Ratio = 1/1)	No	EFH.
Soybean oil acids (Ratio = 1/1)	No	MOA, PPG, SBC.
Stearic acid (Ratio = 1/1)	Yes	AAC, BRD, ECC, ENJ, HIP, MRV.
Tall oil acids (Ratio = 1/1)	No	CHP, WTC, (2).

See footnotes at end of table.

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Surface-active agents	*Separate statistics* [1]	*Manufacturers' identification codes (according to list in table 38)*
Nonionic—Continued		
Carboxylic acid amides—Continued		
Diethanolamine condensates other amine/acid—Continued		
Tallow acids (Ratio = 1/1)	No	MOA.
All other diethanolamine condensates, amine/acid ratio=1/1	No	MOA, QCP.
All other carboxylic acid amides:		
Coconut oil acids	No	STP.
Coconut oil acids-alkanolamine condensate (Ratio = 1/1)	No	AAC, FTX, MOA, PG, PPG, SOS.
Coconut oil acids-alkanolamine condensate (Ratio = 2/1)	No	ENJ, MOA, STP.
Coconut oil acids-alkanolamine condensate (Ratio = 1/2)	Yes	HTN, MOA, PAT, QCP.
Coconut oil acids-dimethylaminopropylamine condensate (Ratio = 1/1)	No	(2).
Coconut oil acids-ethanolamine condensate, ethoxylated	Yes	BRD, GAF, PPG, STP, SVC.
Dioleic acid (Ratio = 1/2)	No	CLD.
Hydrogenated tallow acids, aminoethylethanolamide, acetate salt	No	PCI.
Hydrogenated tallow amides, ethoxylated	No	GAF.
Hydrogenated tallow glycerides diethylenediamine condensate	No	HRT.
Isonanoic acid, mono- and triethanolamine salt	No	HCL.
Isopropanolamine condensates	No	SBC.
Isostearic acid, aminoethylethanolamide, acetate salt	No	PCI.
Lauric acid	No	AAC, HTN, MOA.
Lauric acid (Ratio = 1/1)	No	AAC.
Lauric and myristic acids (Ratio = 1/1)	No	MOA.
Mixed fatty acids, diethanolamine condensate	No	WTC.
Oleic acid-ethanolamine condensate, ethoxylated	No	SHX.
Ricinoleic acid	No	AAC.
Stearic acid (Ratio = 1/1)	No	AAC, MOA, VND.
Stearic acid (Ratio = 2/1)	No	ECC.
Stearic acid aminoethanolamine (amine acid ratio = 1.0/1.65)	No	CHP.
Stearic acid-aminoethyl ethanolamine (amine/acid ratio = 1.75/1.0)	No	SBC.
Stearic acid aminoethylethanolamine (amine acid ratio = 1/2)	No	VKR.
Stearic acid-N-aminoethyl ethanolamine condensate	No	BOE.
Stearic acid-ethylenediamine condensate (Ratio = 1/2)	No	AAC, TCH.
Stearic acid monoethanolamine condensate	No	WTC.
Tall oil acids-dimethylamine condensate (Ratio = 1/1)	No	BKM.
Tall oil fatty acids (Ratio = 1/2)	No	EFH.
Tall oil fatty acids (Ratio = 2.7/1)	No	EFH.
Tall oil fatty acids (Ratio = 1.5/1)	No	EFH.
Tall oil fatty acids-triethanolamine condensate	No	(2).
Tallow acids (Ratio = 1.00/1.65)	No	PAT.
Tallow, N-[3-(dimethylamino)propyl] (Ratio = 1/3)	No	PAT.
All other diethanolamine condensate	No	AAC, EFH, QCP.
All other ethanolamine condensates, amine/acid ratio = 2/1	No	SHX.
All other carboxylic acid amides	No	ARC, CGY, GAF, JTO, ROB, SCP, (2).

See footnotes at end of table.

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Surface-active agents	Separate statistics [1]	Manufacturers' identification codes (according to list in table 38)
Nonionic—Continued		
Carboxylic acid esters:		
Anhydrosorbitol esters:		
Anhydrosorbitol dioleate	No	ICI.
Anhydrosorbitol monoester of tall oil acids	No	HDG.
Anhydrosorbitol monolaurate	Yes	BRD, EMR, ICI, PPG, TCH.
Anhydrosorbitol monooleate	No	BRD, EMR, HDG, ICI, PPG, TCH.
Anhydrosorbitol monopalmitate	No	ICI, PPG.
Anhydrosorbitol monostearate	Yes	BRD, HDG, ICI, PPG, TCH.
Anhydrosorbitol sesquioleate	Yes	BRD, HDG, PPG, TCH.
Anhydrosorbitol sesquistearate	No	TCH.
Anhydrosorbitol triester of tall oil acids	No	(2).
Anhydrosorbitol trioleate	Yes	BRD, ICI, PPG, TCH.
Anhydrosorbitol tristearate	No	BRD, PPG.
All other anhydrosorbitol esters	Yes	BRD.
Diethylene glycol esters:		
Diethylene glycol distearate	No	BRD.
Diethylene glycol monoester of coconut oil acids	No	CLD.
Diethylene glycol monoester of tall oil acids	No	BKM.
Diethylene glycol monoester of tallow acids	No	ENJ.
Diethylene glycol monolaurate	Yes	CTL, ECC, HDG, PPG.
Diethylene glycol monostearate	Yes	AAC, ECC, HDG, STP.
Diethylene glycol sesquiester of tall oil acids	No	ECC.
Diethylene glycol sesquilaurate	No	BRD.
Diethylene glycol terephthalate	No	UPF.
Ethoxylated anhydrosorbitol esters:		
Ethoxylated anhydrosorbitol monolaurate	Yes	BRD, ETC, HDG, ICI, PPG, SVC, TCH.
Ethoxylated anhydrosorbitol mono-oleate	Yes	BRD, ETC, HDG, ICI, SVC, TCH.
Ethoxylated anhydrosorbitol monopalmitate	No	ICI, PPG.
Ethoxylated anhydrosorbitol monostearate	Yes	BRD, ETC, ICI, PPG, TCH.
Ethoxylated anhydrosorbitol monotallate	No	HDG.
Ethoxylated anhydrosorbitol triester of tall oil acids	No	WTC.
Ethoxylated anhydrosorbitol trioleate	Yes	BRD, ETC, HDG, ICI, PPG, TCH.
Ethoxylated anhydrosorbitol tristearate	Yes	BRD, ICI, PPG.
All other ethoxylated anhydrosorbitol esters	No	BRD.
Ethoxylated sorbitol esters:		
Ethoxylated sorbitol beeswax ester	No	ICI.
Ethoxylated sorbitol hexaester of tall oil acids	No	TCH.
Ethoxylated sorbitol hexaoleate	No	ICI, PPG, TCH.
Ethoxylated sorbitol lanolin ester	No	ICI.
Ethoxylated sorbitol monooleate	No	CPC, ICI.
Ethoxylated sorbitol monostearate	No	TCH.
Ethoxylated sorbitol oleate, acetylated	No	ICI.
Ethoxylated sorbitol pentalaurate	No	PPG.
Ethoxylated sorbitol tetraester of lauric and oleic acids	No	ICI.
Ethoxylated sorbitol tetraester of tall oil acids	No	AAC, (2).
Ethoxylated sorbitol tetraoleate	No	ICI.
Ethoxylated sorbitol tetrastearate	No	ICI.
Ethylene glycol esters:		
Ethylene glycol distearate	Yes	AAC, EMR, ENJ, HDG, PPG, STP, TCH, WM.
Ethylene glycol monooleate	No	EFH.
Ethylene glycol monostearate	Yes	AAC, BRD, EMR, HDG, PPG, STP, VND, WM, WTC.
Ethylene glycol sesquistearate	No	JTO, STP.
All other ethylene glycol esters	No	EMR.

See footnotes at end of table.

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Surface-active agents	Separate statistics [1]	Manufacturers' identification codes (according to list in table 38)
Nonionic—Continued		
Carboxylic acid esters—Continued		
Glycerol esters—Continued		
Complex glycerol esters:		
Glycerol diacetyltartrate monooleate	No	HTN.
Glycerol diacetyltartrate monostearate	No	EKT.
Glycerol mono and diesters of mixed fatty acids	No	ICI.
Glycerol monoester of mixed fatty acids, acetylated	No	EKT.
Glycerol monoester of mixed fatty acids succinylated	No	EKT.
Glycerol monooleate, ethoxylated	No	SCP.
All other complex glycerol esters	No	BRD, LEV.
Glycerol esters of chemically defined acids:		
Glycerol dilaurate	No	VND.
Glycerol monolaurate	No	BRD.
Glycerol monooleate	Yes	AAC, BDR, EFH, EMR, HAL, HDG, PPG, STP.
Glycerol monoricinoleate	No	BRD, HDG, PPG.
Glycerol monostearate	Yes	BRD, CCC, CHL, CLD, CRT, EMR, HAL, HDG, HRT, PPG, SOS, SQA, STP, VND, WM, WTC, (2).
Glycerol trioctanoate/decanoate	No.	WM.
All other glycerol esters of chemically defined acids	No	EMR.
Glycerol esters of mixed acids:		
Glycerol diester of coconut oil acids	No	WM.
Glycerol mono-, di-, and triesters of hydrogenated tallow acids	No	WPG.
Glycerol monoester of C_8-C_{10} acids	No	SVC.
Glycerol monoester of coconut oil acids	No	BRD, TCH.
Glycerol monoester of cottonseed oil acids	No	EKT.
Glycerol monoester of hydrogenated cottonseed oil acids	No	EKT, WM.
Glycerol monoester of hydrogenated lard acids	No	EKT.
Glycerol monoester of hydrogenated soybean oil acids	No	BFP, EKT.
Glycerol monoester of lard acids	No	EKT.
Glycerol monoester of palm oil acids	No	EKT.
Glycerol monoester of safflower oil acids	No	EKT.
Glycerol monoester of tall oil acids	No	FER.
Glycerol monoester of tallow acids	No	CPC, EKT.
Glycerol sesquiester of hydrogenated tallow acids	No	PCI.
Glycerol triester of mixed fatty acids	No	SVC.
Mixed ester of resin and rosin acids	No	WVA.
All other glycerol esters of mixed acids	No	BFP, PPG.
Natural fats and oils, ethoxylated:		
Carnuba wax, ethoxylated	No	SHX.
Castor oil, ethoxylated	Yes	CAS, ETC, GAF, HTN, ICI, MIL, PPG, S, SVC, TCH, TMH, (2).
Coconut oil, ethoxylated	No	ETC, HCL.
Hydrogenated castor oil, ethoxylated	Yes	ETC, GAF, HCL, ICI, MIL, PPG, SCP, TCH.
Lanolin, ethoxylated	Yes	AAC, CRD, HCL, HDG, TCH, (2).
Mixed fatty acids, alkyl ether, ethoxylated	No	(2).
Mixed tall oil and rosin acids, ethoxylated	No	HCL.
Oleic acid, ethoxylated and propoxylated	No	MIL.
Tall oil acids, ethoxylated	No	GAF, HCL.
Tall oil acids, ethoxylated and propoxylated	No	(2).
Tall oil, refined, ethoxylated	No	TCH, (2).
Tallow fatty acids, ethoxylated	No	GAF.
All other natural fats and oils, ethoxylated	No	MIL, SCP.

See footnotes at end of table.

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Surface-active agents	Separate statistics [1]	Manufacturers' identification codes (according to list in table 38)
Nonionic—Continued		
Carboxylic acid esters—Continued		
Polyethylene glycol esters:		
Polyethylene glycol esters of chemically-defined acids:		
Polyethylene glycol dilaurate	Yes	BRD, EFH, ETC, HDG, PPG, STP, TCH, WM.
Polyethylene glycol dioleate	Yes	BRD, CLD, EFH, ETC, HAL, MIL, OC, PPG, QCP, SOS, STP.
Polyethylene glycol distearate	Yes	AAC, BRD, PPG, SBC, STP, WTC.
Polyethylene glycol hydroxyacetate	No	CCA.
Polyethylene glycol monocaprylate	No	ECC.
Polyethylene glycol monoisostearate	No	PPG.
Polyethylene glycol monolaurate	Yes	BRD, CCA, CGY, ECC, EFH, ETC, HAL, ICI, PPG, STP, SVC, TCH.
Polyethylene glycol monooleate	Yes	APC, BOE, BRD, CCA, CCC, CLD, CRT, ECC, EFH, ETC, GAF, GDC, HAL, HDG, LUR, MRT, MRV, OC, PPG, SHX, STP, SVC, TCH, WTC.
Polyethylene glycol monooleate, ethoxylated	No	ICI.
Polyethylene glycol monopalmitate	Yes	BRD, ETC, HCL, ICI, SHX.
Polyethylene glycol monopelargonate, methoxylated	No	TCH.
Polyethylene glycol monopelargonate	Yes	ETC, HCL, SOS, TCH.
Polyethylene glycol monoricinoleate	No	ECC.
Polyethylene glycol monostearate	Yes	APC, BRD, CCC, CPC, CRT, DEX, EFH, ETC, GDC, HDG, HRT, ICI, LUR, OC, PPG, SLC, SOS, STP, SVC, TCH, VND.
Polyethylene glycol monotallate	No	LUR, PPG.
Polyethylene glycol sesquinoleate	No	ETC, SOS, TCH.
Polyethylene glycol terephthalate	No	BOE, PCI.
Polyethylene glycol esters of chemically defined acids, all other	No	BAS, ETC, HCL.
Polyethylene glycol esters of mixed acids:		
Polyethylene glycol diester of coconut oil acids	No	PCI.
Polyethylene glycol diester of coconut oil and oleic acids	No	EFH.
Polyethylene glycol diester of mixed linear acid/oleic acid	No	PCI.
Polyethylene glycol diester of tall oil acids	Yes	CCC, EFH, ETC, GAF, PAT, PPG, QCP, (2).
Polyethylene glycol ester of mixed fatty acids	No	SHX, SOS.
Polyethylene glycol monoester of coconut oil acids	No	ICI, LUR.
Polyethylene glycol monoester of soybean oil acids	No	BRD, LUR.
Polyethylene glycol monoester of tall oil acids	Yes	BKM, EFH, FER.
Polyethylene glycol sesquiester of coconut oil acids	No	ENJ, MRT, PAT, PPG, SCP, TCH.
Polyethylene glycol sesquiester of tall oil acids	Yes	ICI, PPG, SLM, WTC, (2).
Polyethylene glycol sesquiester of tallow acids	No	PAT, RPC, SHX, TCH.
All other polyethylene glycol esters of mixed acids	No	ETC, QCP, SCP, WTC.
Polyglycerol esters:		
Hexaglycerol	No	SVC.
Mixed oleic, lauric, stearic, and palmitic hexaglycerol esters	No	SVC.
Polyglycerol decaoleate	No	TCH.
Polyglycerol distearate	No	BRD.
Polyglycerol monooleate	Yes	HDG, PPG, WTC.

See footnotes at end of table.

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Surface-active agents	Separate statistics [1]	Manufacturers' identification codes (according to list in table 38)
Nonionic		
Carboxylic acid esters—Continued		
Polyglycerol esters—Continued		
Polyglycerol monostearate	No	BRD, PPG, SVC.
Polyglycerol tetraoleate	No	PPG.
Triglyerol monooleate	No	SVC.
All other polyglycerol esters	No	BRD.
Propanediol esters:		
1,2-Propanediol dioctanoate/decanoate	No	SVC, WM.
1,2-Propanediol dipelargonate	No	WM.
1,2-Propanediol distearate	No	HCL.
1,2-Propanediol di-2-ethyl hexanoate	No	WM.
1,2-Propanediol monolaurate	No	SBC.
1,2-Propanediol monooleate	No	EFH.
1,2-Propanediol monostearate	Yes	BRD, EKT, HAL, PPG, SBC, WM.
Other carboxylic acid esters:		
Caprylic amphopropionate	No	MOA.
Di-isobutylene maleate	No	RH.
Ethoxylated 1,3-butylene glycol stearate	No	HCL.
Ethoxylated castor oil, ditridecylmaleate	No	UPF.
Ethoxylated glycerol mono- and diesters of hydrogenated tallow acids	No	SVC.
Ethoxylated glycerol and propylene glycol esters of coco fatty acids	No	SVC.
Ethoxylated nonylphenol laurate	No	TCC.
Ethoxylated 1,2-propanediol monostearate	No	ICI.
Ethoxylated and propoxylated glycerol mono- and diesters of tallow acids	No	SVC.
Linoleic acid dimers, alkoxylated	No	(2).
Maleic anhydride, polypropylene glycol copolymer	No	PCI.
Methylglucoside laurate	No	HDG.
Mixed alkyl benzoate	No	APC.
Mixed alkyl stearate	No	SOS.
Mixed di- and triethylene glycol mono ester of tall oil acid	No	WVA.
Nonylphenol ethoxylate, oleate	No	EFH.
Pentaerythritol distearate	No	AAC, PPG.
Pentaerythritol stearate	No	SCP.
Pentaerythritol tetraoleate	No	PPG.
Polyalkylene glycol oleate	No	SOS.
Polycarboxylic acid, alkylate	No	(2).
Polycarboxylic acid, alkylphenoxyalkoxylate	No	(2).
Polypropylene glycol dioleate	No	CLD.
Polypropylene glycol, ethoxylated, adipic acid ester	No	(2).
Propylene glycol esters of hydrogenated palm oil	No	PG, VND.
Propylene glycol monohydroxy stearate	No	CAS.
Sucrose, ethoxylated and propoxylated	No	PPG.
All other carboxylic acid esters	No	ARI, CHP, GAF, HDG, ROB, SYL, (2).
Ethers:		
Benzenoid ethers:		
All other alkylphenol-formaldehyde condensates, alkoxylated	No	ETC, (2).
Amylphenol-formaldehyde, alkoxylated	No	(2).
Bisphenol A, ethoxlated and propoxylated	No	PPG.
Bisphenol A, ethoxylated	No	PPG.
2-Butanol, ethoxylated and propoxylated	No	PPG.

See footnotes at end of table.

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Surface-active agents	Separate statistics [1]	Manufacturers' identification codes (according to list in table 38)
Nonionic—Continued		
Ethers—Continued		
Benzenoid ethers—Continued		
p-tert-Butylphenol-formaldehyde, alkoxylated	No	(2).
Dinonylphenol, ethoxylated	Yes	CPC, ETC, GAF, PPG, RH, S, TCH, (2).
Dodecylphenol, ethoxylated	Yes	ETC, GAF, MON, SCP, TMH.
Epichlorhydrin bisphenol A, ethoxylated	No	(2).
Furfuryl alcohol, ethoxylated	No	SVC.
Iso-octylphenol, ethoxylated	Yes	AAC, BAS, GAF, PPG, RH, TMH.
Isooctylphenol, ethoxylated, benzyl ether	No	PPG.
(Mixed alkyl)phenol, alkoxylated	No	(2).
(Mixed alkyl)phenol epichlorohydrin-formaldehyde, alkoxylated	No	(2).
(Mixed alkyl)phenol, ethoxylated	No	BAS, CPC, ENJ, MIL.
(Mixed alkyl)phenol, ethoxylated, butyl ether	No	RH, TCH.
(Mixed alkyl)phenol-formaldehyde, alkoxylated	Yes	ENJ, GAF, WTC, (2), (2).
(Mixed alkyl)phenol formaldehyde, methoxylated	No	HCL.
Naphthalenesulfonic acid, polymer with formaldehyde and 4,4'-dihydroxydiphenylsulfone	No	PCI.
Naphthalenesulfonic acid, polymer with formaldehyde, sodium salt	No	PCI.
Naphthalenesulfonic acid, polymer with formaldehyde and 4,4'-dihydroxydiphenylsulfone, ammonium salt	No	PCI.
Nonylphenol, ethoxylated	Yes	AAC, BAS, CPC, DUP, ENJ, ETC, GAF, HCL, HDG, HTN, ICI, MIL, MOA, MON, OMC, PPG, RH, S, SCP, SHX, STP, TCH, TMH, TX, UCC, WTC, (2), (2), (2).
Nonylphenol, ethoxylated, phosphate esters	No	OMC.
Nonylphenol, ethoxylated and propoxylated	Yes	GAF, HCL, RH, SCP, TMH, (2).
Nonylphenol, ethoxylated, with fumaric acid	No	PPG.
Nonylphenol, ethoxylated with mixed fatty acids	No	SOS.
Nonylphenol-formaldehyde, alkoxylated	No	WTC, (2), (2).
Nonylphenol oleate, ethoxylated	No	SOS.
n-Octylphenol, ethoxylated	Yes	AAC, DUP, GAF, SCP, TCH, WTC.
tert-Octylphenol-formaldehyde, ethoxylated	No	SDW.
Phenol, ethoxylated	No	GAF, HCL, ICI, MIL, PPG, SCP, TCH.
Phenol-formaldehyde resin (with lignite)	No	PSP.
Phenylstyrene, ethoxylated	No	HCL.
Soya sterols, ethoxylated	No	SCP.
Tridecylphenol, ethoxylated	No	CPC.
All other benzenoid ethers	No	BAS, HCL, RH, SHX.
Nonbenzenoid ethers:		
Chemically-defined linear alcohols, alkoxylated		
Butanol, ethoxylated	No	GAF, PPG.
Butyl alcohol, propoxylated	No	WTC.
Decyl alcohol, ethoxylated	Yes	BAS, CPC, ENJ, GAF, HCL, ICI, MIL, S, TCH.
Decyl alcohol, ethoxylated and propoxylated	No	GAF.
Decyloxypoly(ethyleneoxy)ethyl chloride	No	GAF.
Dodecyl alcohol, ethoxylated	Yes	AAC, CPC, ICI, MIL, PPG, (2).
Glycerol, ethoxylated	No	SVC.
Hexadecyl alcohol, ethoxylated	No	ICI, TCH.
Hexadecyl alcohol, propoxylated	No	PPG.
Isodecyl alcohol, alkoxylated	No	S, (2).
Isostearyl alcohol, ethoxylated	No	SHX.
Methanol, ethoxylated and propoxylated	No	PPG.
Methyl alcohol, alkoxylated	No	(2).
9-Octadecenyl alcohol, ethoxylated	Yes	AAC, ETC, GAF, ICI, MIR, S, TCH.
Octadecyl alcohol, ethoxylated	No	CPC, GAF, HCL, HTN, ICI, PPG, SCP.

See footnotes at end of table.

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Surface-active agents	Separate statistics [1]	Manufacturers' identification codes (according to list in table 38)
Nonionic—Continued		
Ethers—Continued		
Nonbenzenoid ethers—Continued		
Chemically-defined linear alcohols, alkoxylated—Continued		
Oleyl alcohol, ethoxylated	Yes	CRD, HCL, PPG, SHX.
Stearyl alcohol, propoxylated	No	SVC.
All other chemically-defined linear alcohols, alkoxylated	No	BAS, GAF, HDG, SCP.
Mixed linear alcohols, alkoxylated:		
Coconut oil alcohol, ethoxylated	No	ETC, HCL, TX.
Decyl and octyl alcohols, ethoxylated	No	GAF, SHX.
Mixed linear alcohols, alkoxylated	No	WTC, (2).
Mixed linear alcohols, ethoxylated	Yes	AAC, BAS, DUP, GAF, HCL, HDG, ICI, MIL, PG, PPG, RH, S, SCP, SHC, SHX, STP, TCH, TMH, TNA, TX, UCC, VST, WTC.
Mixed linear alcohols, ethoxylated, benzyl ether	No	(2).
Mixed linear alcohols, ethoxylated and propoxylated	Yes	BAS, DUP, ETC, GAF, MIL, OMC, PPG, S, STP, SVC, TCH, UCC, (2).
Myristyl alcohol, propoxylated	No	WTC.
Stearyl alcohol, propoxylated	No	WTC.
Tallow alcohol, ethoxylated	No	ENJ, ETC, GAF, HCL, SHX, TX.
Wool wax alcohols, ethoxylated	No	CRD.
All other mixed linear alcohols, alkoxylated	No	BRD, RH, SHC, (2).
Other ethers and thioethers:		
Bis-cumylphenyl-oxoethylene titanate	No	KPI.
1,3-Butylene glycol, ethoxylated	No	HCL.
tert-Dodecyl mercaptan, ethoxylated	No	AAC, ETC, GAF.
Glycerine, alkoxylated	No	(2).
Glycerine, ethoxylated	No	PPG.
Glycerine, ethoxylated and propoxylated	No	PPG.
Glycerol, alkoxylated, toluene diisocyanate copolymer	No	(2).
Isodecyl alcohol, ethoxylated	No	ETC.
Isodecyl alcohol, ethoxylated and propoxylated	No	ETC.
Iso-octyl alcohol, ethoxylated	No	ETC.
Lignin, ethoxylated	No	WVA.
Mixed alcohols, ethoxylated	Yes	ENJ, MIL, RH, WM, (2).
Poly(epichlorhydrin)	No	(2).
Polyether diols	No	WTC.
Polyether triols	No	WTC.
Polyethoxylate/polypropoxylate dibenzyl ether	No	(2).
Polyethylene glycol mono(nonylphenol)ether ammonium sulfate	No	(2).
Poly(mixed ethylene, propylene)glycol	Yes	AAC, ETC, GAF, S, UCC, WTC, (2), (2).
Poly(oxy-1,2-ethanediyl), α-phenylmethyl-ω-hydroxy, C_{12}-C_{15} alkyl ethers	No	PCI.
Poly(oxy-1,2-ethanediyl), α-phenylmethyl-ω-hydroxy, ethoxylated nonylphenol alkyl ether	No	PCI.
Polypropylene glycol, alkoxylated, polymer with maleic anhydride, acrylic acid, and alkylphenol-formaldehyde resin, alkoxylated	No	(2).
Polypropylene glycol, ethoxylated	No	BAS, ETC, GAF, HCL, HDG, SCP, TCH, WTC, (2).
Polypropylene glycol glycerol triether, copolymer with epichlorhydrin bisphenol epoxy resin	No	(2).
Tall oil fatty acid-imidazoline, ethoxylated	No	(2).
2,4,7,9-Tetramethyl-5-decyne-4,7-diol, ethoxylated	No	SCP.
Tridecyl alcohol, ethoxylated	Yes	CPC, DUP, ETC, GAF, HCL, ICI, MIL, OMC, S, TCH, WTC, (2).

See footnotes at end of table.

Table 37—Continued

Surface-active agents for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Surface-active agents	*Separate statistics* [1]	*Manufacturers' identification codes (according to list in table 38)*
Nonionic—Continued		
Ethers—Continued		
Other ethers and thioethers—Continued		
Tridecyl alcohol, propoxylated and ethoxylated	No	ETC, HTN, TX.
Trimethylnonyl alcohol, ethoxylated	No	UCC.
Trimethylolpropane, alkoxylated	No	BAS, GAF, WTC, (2).
Trimethylpentanediol, ethoxylated	No	SHX.
All other ethers and thioethers	No	GAF, HCL, OMC, RH, SCP, SHX.
Other nonionic surface-active agents:		
Cumyl phenolate isopropoxy titanium salt	No	KPI.
Formaldehyde, dicyandiamide, ethylene sulfate polymers	No	PCI.
(Mixed alkyl)phenol alkylenediaminealkanolamine formaldehyde	No	(2).
Mixed fatty acid-ethoxylated nonyl phenol ester	No	RPC.
Tetra-(2,2-diallyloxymethylene)-1-butoxy titanium bis-(ditridecyl) phosphite	No	KPI.
Tetra-isopropoxy titanium (bis-dioctyl) phosphite	No	KPI.
Tetra-octyloxy titanium (bis-tridecyl) phosphite	No	KPI.
Tri(castor oil alkyl)phosphate	No	BRD.
All other nonionic surface-active agents	No	CGY, CLU, DUP, LUR, MIL, MOA, PG, PPG, SCP, TCH, WM, (2), (2).

[1] Chemicals for which separate statistics are reported in this section are indicated by 'Yes.' Chemicals for which data are accepted in confidence and may not be published are indicated by 'No.'
[2] The manufacturer did not consent to his identification with the designated products,

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 38

Surface-active agents: Directory of manufacturers, alphabetical by code, 1988

Code	Name of company
AAC	Alcolac, Inc.
ACT	Climax Performance Materials Corp.
ACY	American Cyanamid Co.
AGP	Dial Corp.
AMU	American Emulsion
APC	Apollo Chemicals Corp.
APX	Apex Chemical
ARC	Akzo Chemie America, Armak Chemicals
ARD	Ardmore Chemical Co. Inc.
ARI	Atlas Refinery, Inc.
ARL	Arol Chemical Products Co.
ARZ	Arizona Chemical Co.
BAS	BASF Corp.
BFP	Breddo Corp.
BKM	Buckman Laboratories, Inc.
BLA	Astor Products, Inc., Blue Arrow Div.
BOE	Boehme Filatex, Inc.
BRD	Lonza, Inc.
BRI	Sedgefied Specialities
BSW	Original Bradford Soap Works, Inc.
CAS	CasChem, Inc.
CCA	Akzo Chemicals, Inc.
CCC	C.N.C. International, Inc.
CCL	Catawba-Charlab, Inc.
CCW	Morton-Thiokol, Inc., Carstab Div.
CGY	Ciba-Geigy Corp.
CHL	Chemol Co.
CHP	C. H. Patrick & Co., Inc.
CIN	Stockhausen, Inc.
CLD	Colloids, Inc.
CLU	CL Industries, Inc.
CMT	Chemithon Corp.
CON	Concord Chemicals Co., Inc.
CP	Colgate-Palmolive Co.
CPC	Grant Industries, Inc.
CRD	Croda, Inc.
CRT	Chemos Corp.
CTL	Continental Chemical Co.
DAN	Dan River, Inc., Chemical Products Div.
DEX	Dexter Chemical Corp.
DOW	Dow Chemical Co.
DUP	E. I. duPont de Nemours & Co., Inc. Chemicals & Pigments Dept.
ECC	Eastern Color & Chemical Co.
EFH	E. F. Houghton & Co.
EK	Eastman Kodak Co.:
EKT	Tennessee Eastman Co. Div.
EMK	Emkay Chemical, Inc.
EMR	Quantum Chemical Corp., Emery Div.
ENJ	Exxon Chemical Americas
ENO	Enenco, Inc.
ESS	Essential Industries, Inc.
ETC	Ethox Chemicals, Inc.
FER	Ferro Corp., Keil Chemical Div.
FPC	Flambeau Paper Corp.
FTX	Finetex, Inc.
GAF	GAF Corp., Chemical Group
GDC	Gresco, Inc.
GRL	Calgon Vestal Laboratories, Inc.
HAL	C. P. Hall Co.
HCL	Hoechst Celanese Corp., Sou-Tex Works
HDG	Hodag Chemical Corp.
HEW	Hewitt Soap Co., Inc.
HIL	Hilton Davis Company
HIP	High Point Chemical Corp.
HMP	W. R. Grace & Co., Hampshire Chemicals Div.
HNT	Huntington Laboratories, Inc.
HPC	Hercules, Inc.
HRT	Hart Products Corp.
HTN	Heterene Chemical Co.
HXL	Hexcel Corp., Hexcel Chemical Products
ICI	ICI Americas, Inc., Chemicals Div.
JLP	J. L. Prescott Co.
JRG	Andrew Jergens Co.
JTO	Jetco Chemicals, Inc.
KPI	Kenrich Petrochemicals, Inc.
LEA	Leatex Chemical Co.
LEV	Lever Brothers Co.
LKY	Lake States Div. of Rhinelander Paper Co.
LUR	Reilly Whitman, Inc.
MAR	Daishowa Chemicals, Inc.
MCP	Moretex Chemical Products, Inc.
MIL	Milliken & Co., Milliken Chemical Div.
MIR	Miranol Chemical Co., Inc.
MOA	Mona Industries, Inc.
MON	Monsanto Co.
MRT	Morton-Thiokol, Inc., Morton Chemical Div.
MRV	Marlowe-Van Loan Corp.
NCC	Niacet Corp.
NES	Ruetgers-Nease Chemical Co.
NMC	National Milling & Chemical Co.
NOC	Norac Co., Inc., Mathe Div.
NPR	Safeway Stores, Inc.
NSC	National Starch & Chemical Corp.
OC	Omega Chemicals, Inc.
OMC	Olin Corp.
PAT	Pat-Chem, Inc.
PCH	Prochem
PCI	Piedmont Chemical Industries, Inc.
PEL	Pelron Corp.
PG	Procter & Gamble Co., Procter & Gamble Mfg. Co.
PIL	Pilot Chemical Co.
PLX	Desoto, Inc.
PNX	Murphy-Phoenix Co.
PPG	PPG Industries, Inc.
PSP	Georgia-Pacific Corp., Bellingham Div.
QCP	Quaker Chemical Corp.
RAY	ITT Rayonier, Inc.

Table 38—Continued
Surface-active agents: Directory of manufacturers, alphabetical by code, 1988

Code	*Name of company*	*Code*	*Name of company*
REZ	Hi-Tek Polymers, Inc.	TCC	Sybron Chemicals, Inc.
RH	Rohm & Haas Co.	TCH	Quantum Chemical Corp.
ROB	Robeco Chemicals, Inc.	TEN	Tennessee Chemical Co.
RPC	Colloids, Inc.	TMH	Harcros Chemicals, Inc.
RSA	R.S.A. Corp.	TNA	Ethyl Corp.
S	Sandoz, Inc., Colors & Chemicals Div.	TNI	Gillette Co., Chemical Div.
SBC	Scher Chemicals, Inc.	TX	Texaco Inc., Texaco Chemical Co.
SBP	SBS Products Inc.	UCC	Union Carbide Corp.
SCO	Scholler, Inc.	UDI	Desoto, Inc.
SCP	Henkel Corp.	UNN	United Aniline Co.
SDH	Sterling Drug, Inc.:	UPF	Sloss Industries
SDW	Sterling Organics Div.	USR	Uniroyal, Inc., Uniroyal Chemical Div.
SHC	Shell Oil Co., Shell Chemical Co.	UTC	Unitex Chemical Corp.
SHX	Sherex Chemical Co., Inc.	VKR	Virkler Co.
SLC	Soluol Chemical Co., Inc.	VND	Van Dyk, Div. of Mallinckrodt, Inc.
SLM	Salem Oil & Grease Co.	VST	Vista Chemical Inc.
SOS	SSC Industries, Inc.	WHW	Whittemore-Wright Co., Inc.
SPA	Scott Paper Co.	WM	Inolex Chemical Co.
SQA	Sequa Chemicals, Inc.	WPG	West Point-Pepperell, Inc., Grifftex Chemical Co. Sub.
STP	Stepan Chemical Co.	WTC	Witco Chemical Corp.
SVC	Capital City Products Co., Armstrong Chemical Plant	WVA	Westvaco Corp.
SYL	Sylvachem Corp.		

Note.—Complete names, telephone numbers, and addresses of the above reporting companies are listed in app. A.
Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Section 13

Pesticides and Related Products

Pesticides and related products include fungicides, herbicides, insecticides, rodenticides, and related products such as plant growth regulators, seed disinfectants, soil conditioners, soil fumigants, and synergists. The data are given in terms of 100 percent active materials; they exclude such materials as diluents, emulsifiers, and wetting agents.

U.S. production of pesticides and related products in 1988 amounted to 1,164 million pounds, 12 percent more than the 1,040 million pounds reported for 1987 (table 39). Sales in 1988 were 935 million pounds, an increase of 3 percent, as compared with 911 million pounds reported in 1987; the value of sales was $4,354 million in 1988, compared with $4,171 million in 1987—an increase of 4 percent. Data for production of pesticides and related products during 1984–88 are shown in figure 14.

The output of cyclic pesticides and related products amounted to 760 million pounds in 1988, 17 percent more than the 647 million pounds produced in 1987. Sales in 1988 were 572 million pounds, valued at $3,054 million, compared with 593 million pounds, valued at $2,828 million, in 1987.

Production of acyclic pesticides and related products in 1988 amounted to 404 million pounds, compared with 392 million pounds reported for 1987. Sales in 1988 were 363 million pounds, compared with 318 million pounds reported for 1987; the value of sales were $1,299 million in 1988, compared with $1,342 million in 1987.

Table 40 lists the products reported in this section and indicates the manufacturer(s) of each by code. These codes are identified by company name in table 41.

Stephen Wanser
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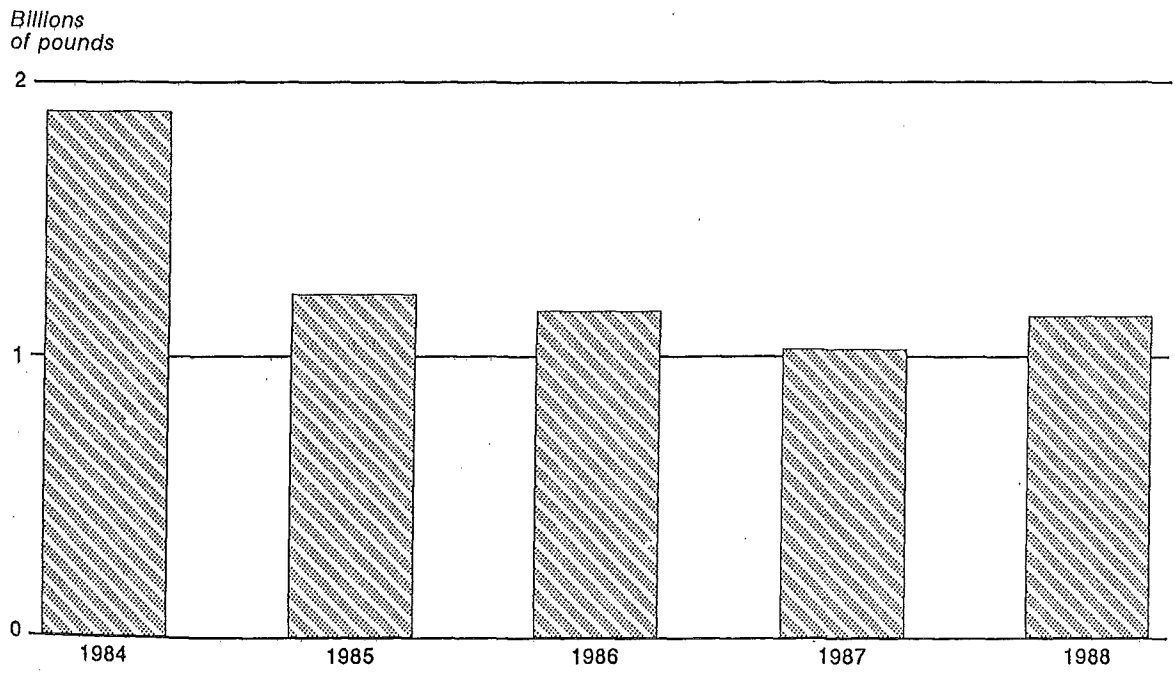
Figure 14
Pesticides and related products: U.S. production, 1984-88



Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 39
Pesticides and related products: U.S. production and sales, 1988

Pesticides and related products	Production	Sales Quantity	Sales Value	Average Unit value[1]
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Grand total	1,163,833	935,174	4,353,738	$4.66
Cyclic				
Total	759,704	572,160	3,054,331	5.34
Fungicides, total	85,389	70,442	271,670	3.86
Naphthenic acid, copper salt	3,424	1,773	1,675	.94
All other cyclic fungicides[2]	81,965	68,669	269,995	3.93
Herbicides and plant growth regulators, total	589,261	419,869	1,933,397	4.60
3',4'-Dichloropropionanilide (Propanil)	13,038	(3)	(3)	(3)
Phenoxy acetic acid derivatives	65,564	52,614	45,224	.86
All other cyclic herbicides[4]	510,659	367,255	1,888,173	5.14
Insecticides and rodenticides, total	85,054	81,849	849,264	10.38
Chlorinated insecticides	3,703	4,007	13,462	3.36
Organophosphorus insecticides[5]	44,653	37,054	284,933	7.69
All other cyclic insecticides and rodenticides[6]	36,698	40,788	550,869	13.51
Acyclic				
Total	404,129	363,014	1,299,407	3.58
Fungicides[7]	24,175	18,912	44,190	2.34
Herbicides and plant growth regulators[8]	112,518	109,523	743,925	6.79
Insecticides, rodenticides, soil conditioners, and fumigants, total	267,436	234,579	511,292	2.18
Organophosphorus insecticides[9]	93,865	57,739	275,488	4.77
All other acyclic insecticides, rodenticides, soil conditioners, and fumigants[10]	173,571	176,840	235,804	1.33

[1] Calculated from unrounded figures.
[2] Includes benomyl, captafol, captan, chlorothalonil, DMTT, folpet, pipron, PMA, and others.
[3] Reported data were accepted in confidence and may not be published, or no data were reported.
[4] Includes alachlor, atrazine, benefin, bensulide, 2,4-D and other 2,4-D esters and salts, dicamba, dinitrophenol compounds, diuron, DNBP, isopropyl phenylcarbamates (IPC and CIPC), maleic hydrazide, molinate, NPA, picloram, triazines, trifluralin, uracils, plant growth regulators, and others.
[5] Includes diazinon, methyl parathion, and other phosphorothioates and phosphorodithioates.
[6] Includes carbaryl, chlorinated insecticides (chlordan, heptachlor, and others), insect attractants, DEET and other insect repellents, small amounts of rodenticides, and others.
[7] Includes dithiocarbamates.
[8] Includes butylate, dalapon, EPTC, methanearsonic acid salts, thiocarbamates, and organophosphorus erbicides, and others.
[9] Includes acephate, disulfoton, ethion, malathion, phorate, and other organophosphorus insecticides.
[10] Includes aldicarb, methomyl, methyl bromide, soil conditioners and fumigants, small quantities of rodenticides, and others.

Note.—Does not include data for the insect fumigant, p-dichlorobenzene, nor the fuungicide, o-phenylphenol. These data are included in the section on "Cyclic Intermediates." It also does not include data for the fungicides, dimethyldithiocarbamic acid, sodium salt and dimethyldithiocarbamic acid, zinc salt (i.e., ziram). These data are included in the section on "Rubber-Processing Chemicals." The data for ethylene dibromide, a fumigant, are included in the "Miscellaneous End-Use Chemicals and Chemical Products" section.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 40

Pesticides and related products for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Pesticides and related products	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 41)*
Cyclic:	Yes	
Fungicides:	Yes	
2-Bromo-4'-hydroxyacetophenone	No	BKM.
1-(4-Chlorophenoxy)-3,3-dimethyl-1-(1,2,4-triazol-1-yl)-butan-2-one	No	CHG.
α-(2-Chlorophenyl)-α-(4-chlorophenyl)-5-pyrimidinemethanol	No	LIL.
α-(2-Chlorophenyl)-α-(4-fluorophenyl)-5-pyrimidinemethanol	No	LIL.
2,4-Dichloro-6-(o-chloroanilino)-s-triazine	No	CHG.
1,4-Dichloro-2,5-dimethoxybenzene (Chloroneb)	No	CHF.
Diphenylmercuric dodecenyl succinate	No	COS.
Hexahydro-1,3,5-triethyl-s-triazine	No	VNC.
Hexahydro-1,3,5-tri(2-hydroxyethyl)-s-triazine	No	([2]).
2-Mercaptobenzothiazole, sodium salt	No	NOD, ([2]).
Methyl-1-(butylcarbamoyl)-2-benzimidazolecarbamate (Benomyl)	No	DUP, GTL.
2,2'-Methylenebis(4-chlorophenol) (Dichlorophene)	No	GIV.
3-(2-Methylpiperidino)propyl-3,4-dichlorobenzoate(Pipron)	No	LIL, USR.
5-Methyl-1,2,4-triazolo3,4-benzothiazole (Tricyclazole)	No	LIL.
Naphthenic acid, copper salt	Yes	CCA, MCI, NOD, TRO.
2-n-Octyl-4-isothiazolin-3-one	No	RH.
Pentachlorophenol, sodium salt	No	FRO.
Phenylmercuric acetate (PMA)	No	COS.
Phenylmercuric ammonium acetate	No	COS.
Phenylmercuric oleate	No	COS, TRO.
8-Quinolinol, copper salt	No	NOD.
8-Quinolinol, magnesium salt	No	FMT.
8-Quinolinol, sulfate salt	No	SOM.
2,4,5,6-Tetrachloroisophthalonitrile	No	SDS.
Tetrahydro-3,5-dimethyl-2H-1,3,5-thiadiazine-2-thione (DMTT)	No	BKM, MRK, VCC.
2-(Thiocyanomethylthio)benzothiazole	No	BKM.
N-Trichloromethylthio-4-cyclohexene-1,2-dicarboximide (Captan)	No	ICI, VNC.
N-Trichloromethylthiophthalimide (Folpet)	No	ICI.
All other cyclic fungicides	No	FER, NOD.
Herbicides and plant growth regulators:	Yes	
4-Amino-6-(1,1-dimethylethyl)-3-(methylthio)-1,2,4-triazin-5-(4H)-one	No	CHG, DUP.
4-Amino-3,5,6-trichloropicolinic acid (Picloram)	No	DOW.
4,6-Bis(isopropylamino)-2-methoxy-s-triazine (Prometon)	No	CGY.
2,4-Bis(isopropylamino)-6-(methylthio)-s-triazine (Prometryn)	No	CGY.
5-Bromo-3-sec-butyl-6-methyluracil (Bromacil)	No	DUP.
2-(sec-Butylamino)-4-ethylamino-6-methoxy-s-triazine	No	CGY.
3-tert-Butyl-5-chloro-6-methyluracil	No	DUP.
N-Butyl-N-ethyl-a,a,a,-trifluoro-2,6-dinitro-p-toluidine (Benefin)	No	LIL.
Butyl 2-[4-[5-(trifluoromethyl)-2-pyridinyl]oxy]-phenoxy]propanoate	No	([2]).
1-(Carboethoxy)ethyl 5-[2-chloro-4-(trifluoromethyl) phenoxy]-2-nitrobenzoate	No	DOW, SOC.
2-Chloro-4,6-bis(ethylamino)-s-triazine (Simazine)	No	CGY.

See footnotes at end of table.

Table 40—Continued

Pesticides and related products for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Pesticides and related products	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 41)*
Cyclic—Continued		
Herbicides and plant growth regulators—Continued		
2-Chloro-4,6-bis(isopropylamino)-s-triazine (Propazine)	No	CGY.
2-Chloro-2',6'-diethyl-N-(n-butoxymethyl)-acetanilide (Butachlor)	No	MNA.
2-Chloro-2',6'-diethyl-N-(methoxymethyl) acetanilide(Alachlor)	No	MNA.
2-Chloro-N-ethoxymethyl-N-(2-ethyl-6-methylphenyl)-acetamide (Acetochlor)	No	MNA.
2-Chloro-1-(3-ethoxy-4-nitrophenoxy)-4-(trifluoromethyl)benzene (Oxyfluorfen)	No	RH.
2-Chloro-4-(ethylamino)-6-(isopropylamino) -s-triazine (Atrazine)	No	CGY, DUP.
2-[4-Chloro-6-(ethylamino)-s-triazin-2-ylamino]-2-methylpropionitrile (Cyanazine)	No	DUP.
2-Chloro-N-[isopropylacetanilide (Propachlor)	No	MNA.
2-Chloro-N-[(4-methoxy-6-methyl-1,3,5-triazin-2-yl)-aminocarbonyl]benzenesulfonamide	No	DUP.
2-(4-Chloro-2-methylphenoxy)propionic acid, dimethylamine salt	No	RIV.
2-(2-Chlorophenyl)methyl-4,4-dimethyl-3-isoxazolinone	No	FMN, (2).
2-[4[(6-Chloro-2-quinoxalinyl)oxy]phenoxy]propionil acid ethyl ester (Quizalofod ethyl)	No	DUP.
3-Cyclohexyl-6-(dimethylamino)-1-methyl-1,3,5-triazine-2,4-(1H,3H)-dione	No	DUP.
3,6-Dichloro-2-anisic acid (Dicamba)	No	ZOC.
2,6-Dichlorobenzonitrile	No	USR.
2-(2,4-Dichlorophenoxy)propionic acid, dimethylamine salt	No	RIV.
2-(2,4-Dichlorophenoxy)propionic acid, isooctyl ester	No	RIV.
3-(3,4-Dichlorophenyl)-1,1-dimethylurea (Diuron)	No	DUP.
3-(3,4-Dichlorophenyl)-1-methoxy-1-methylurea (Linuron)	No	DUP.
2-(3,4-Dichlorophenyl)-4-methyl-1,2,4-oxadiazolidine-3,5-dione (Methazole)	No	ZOC.
1-(2,4-Dichlorophenyl)4-propyl-1,3-dioxolan-2-ylmethyl-1H-1,2,4-triazole	No	ICI.
2-(3,5-Dichlorophenyl)-2-(2,2,2-trichloroethyl)-oxirane (tridiphane)	No	ICI.
3',4'-Dichloropropionanilide (Propanil)	Yes	CED, CYT, RH.
3,7-Dichloro-8-quinolinic acid	No	NES.
S-(O,O-Diisopropyl phosphorodithioate) ester of N-(α-mercaptoethyl)benzenesulfonamide (Bensulide)	No	ICI.
1,1'-Dimethyl-4,4'-bipyridinium dichloride	No	ICI, (2).
N,N-Dimethyl-2,2-diphenylacetamide (Diphenamid)	No	CWN.
Dimethyl-2,3,5,6-tetrachloroterephthalate (DCPA)	No	SDS.
N-5-1,1-Dimethyl)-1,3,4-thiadiazol-2-yl-N,N-dimethylurea (Tebuthiuron)	No	LIL.
1,1-Dimethyl-3-(α,α,α-trifluoro-m-tolyl)urea (Fluometuron)	No	CGY.
Dinitrobutylphenol (DNBP)	No	CED.
Dinitrobutylphenol,triethanolamine salt	No	CED.
2,6-Dinitro-N,N-dipropyl cumidine	No	LIL.
3,5-Dinitro-N;N-dipropylsulfanilamide	No	(2).
2-(Ethylamino)-4-(isopropylamino)-6-(methylthio) -s-triazine (Ametryne)	No	CGY.

See footnotes at end of table.

Table 40—Continued

Pesticides and related products for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Pesticides and related products	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 41)*
Cyclic—Continued		
Herbicides and plant growth regulators—Continued		
Ethyl 2-[[[[(4-chloro-6-methoxypyrimidin-2-yl)-amino]carbonyl]amino]sulfonyl]benzoate (Chlorimuron ethyl)	No	DUP.
S-Ethyl cyclohexylmethylthiocarbamate	No	ICI.
S-Ethyl-hexahydro-1H-azepine-1-carbothioate (Molinate)	No	ICI.
N-[3-(1-Ethyl-1-methylpropyl)-5-isoxazolyl]-2,6-dimethoxybenzamide (Flexidor)	No	LIL.
N-(1-Ethylpropyl)-3,4-dimethyl-2,6-dinitrobenzenamine	No	ACY.
Isopropyl N-(3-chlorophenyl)carbamate (CIPC)	No	PPG, SOC.
2-(2-Methyl-4-chlorophenoxy)propionic acid, diethanolamine salt	No	RIV.
2-(2-Methyl-4-chlorophenoxy)propionic acid, isooctyl ester	No	RIV.
1-(2-Methylcyclohexyl)-3-phenylurea (Siduron)	No	ADC, DUP.
Methyl 2-[[[[(4,6-dimethoxypyrimidin-2-yl)-amino]carbonyl]amino]sulfonyl]methyl]benzoate (Bensulfuron) (Londax)	No	DUP.
Methyl 2-[[[[(4,6-dimethyl-2-pyrimidinyl)amino-carbonyl]amino]sulfonyl]benzoate	No	DUP.
1-Methyl-3-phenyl-5-[3-(trifluoromethyl)phenyl]-4(1H)-pyridone (Fluridone)	No	LIL.
N-1-Naphthylphthalamic acid (NPA)	No	USR.
7-Oxabicyclo-[2.2.1]-heptane-2,3-dicarboxylic acid, disodium salt (Endothall)	No	PAS.
Phenoxyacetic acid derivatives:	Yes	
4-Chloro-2-methylphenoxyacetic acid, dimethylamine salt	No	RIV.
4-Chloro-2-methylphenoxyacetic acid, iso-octyl ester	No	RIV.
2,4-dichlorophenoxyacetic acid, esters and salts:		
2,4-Dichlorophenoxyacetic acid (2,4-D)	No	DOW, GTH.
2,4-Dichlorophenoxyacetic acid, sec-butyl ester	No	DOW.
2,4-Dichlorophenoxyacetic acid, dimethylamine salt	No	DOW, PBI, RIV.
2,4-Dichlorophenoxyacetic acid, ethanolamine and isopropanolamine salts	No	DOW, RIV.
2,4-Dichlorophenoxyacetic acid, iso-octyl ester	No	DOW.
2,4-Dichlorophenoxyacetic acid, isopropyl ester	No	AMV.
Plant growth regulators:		
N-[Acetylamino)methyl]-2-chloro-N-(2,6-diethylphenyl)acetamide	No	MNA.
α-(4-Chlorophenyl)methyl-α-(1,1-dimethylethyl)-1, 2,4-triazole-1-ethanol	No	(2).
2-Chloro-6-(trichloromethyl)pyridine	No	DOW.
α-Cyclopropyl-α-(p-methoxyphenyl)-5-pyrimidine methanol (Ancymidol)	No	LIL.
2,4-Dichlorobenzyltributylphosphonium chloride	No	USR.
2,3-Dihydro-5,6-dimethyl-1,4-dithiin-1,1,4,4-tetraoxide	No	NES.
1,1-Dimethylpiperidinium chloride	No	BAS.
N-[2,4-dimethyl-5-[[trifluoromethyl]sulfonyl]-amino]phenyl]acetamide, diethanolamine salt	No	MMM.
Gibberellic acid	No	ABB.
α-(1-methylethyl-α-[4-trifluore-methoxy]phenyl)-5-pyrimidinemethanol (Flurprimidol)	No	LIL.
3,5,6-Trichloro-2-pyridinyloxyacetic acid	No	DOW.
α,α,α-Trifluoro-2,6-dinitro-N,N-dipropyl-p-toluidine (Trifluralin)	No	LIL.

See footnotes at end of table.

Table 40—Continued

Pesticides and related products for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Pesticides and related products	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 41)*
Cyclic—Continued		
Herbicides and plant growth regulators—Continued		
Plant growth regulators—Continued		
α,α,α-Trifluoro-2,6-dinitro-N-ethyl-N-(2-methyl-2-propenyl)-p-toluidine (Ethylfluralin)	No	LIL.
All other cyclic herbicides	No	FRI, RH, SOC.
Insect attractants and repellents:		
N,N-Diethyltoluamide (DEET)	No	HCL, MRF, TNA.
All other insects attractants	No	ICI.
Insecticides:	Yes	
Bacillus thuringiensis	No	ABB, ZOC.
Bis(pentachloro-2,4-dicyclopentadien-1-yl)	No	ZOC.
2,3,4,5-δ^2-Butenylene-tetrahydrofurfural	No	PLC.
2-(p-tert-Butylphenoxy)cyclohexyl-2-propynyl sulfite	No	ACY, USR.
Cyano(4-fluoro-3-phenoxyphenyl)methyl-3-(2,2-dichloro-ethenyl)-2,2-dimethylcyclopropane carboxylate	No	FMN.
Cyano-3-phenoxybenzyl-cis, trans-3-(2,2-dichlorovinyl)-2, 2-dimethylcyclopropane carboxylate	No	(2).
Cyano(3-phenoxyphenyl)methyl-4-chloro-α-(1-methylethyl)benzeneacetate	No	DUP.
All other cyclic insecticides	No	FMN, ZOC, (2).
Cypermethrin	No	CED, FMN.
O,O-Diethyl O-(2-diethylamino-6-methyl-4-pyrimidinyl)phosphorothioate	No	(2).
2,3-Dihydro-2,2-dimethyl-7-benzofuranyl [(dibutylamino)thio]methyl carbamate	No	FMN, NES.
2,3-Dihydro-2,2-dimethyl-7-benzofuranyl methylcarbamate	No	FMN.
2,3-dihydroxy-2,2-dimethyl-7-benzofuranyl	No	(2).
Di-n-propylisocinchomeronate	No	MGK.
Distinnaxane, hexakis(2-methyl-2-phenylpropyl)	No	DUP.
Methyl 3-(2,2-dichloroethenyl)-2,2-dimethyl-3-cyano-3-phenoxyphenylcyclopropanecarboxylate	No	FMN.
3-(Phenoxyphenyl) methyl-cis, trans-3-(2,2-dichloroethenyl)-2,2-dimethyl cyclopropane-carboxylate	No	CED, FMN, (2).
Tetrahydro-3,5-dimethyl-2(1H)-pyrimidinone [3-[4-(trifluoromethyl)phenyl]-1-[2-[4-(trifluoromethyl)phenyl]ethenyl]-2-propenylidine] hydrozone	No	ACY.
Tricyclohexyltin hydroxide	No	DOW.
Chlorinated insecticides:	Yes	
2-Chloro-N-[[[4-(trifluoromethoxy)phenyl]amino]-carbonyl]benzamide	No	CHG.
Heptachloro-tetrahydro-endo-methanoindene (Heptachlor)	No	VEL.
Octachlorohexahydro-4,7-methanoindene (Chlordan)	No	VEL.
1,1,1-Trichloro-2,2-bis(p-methoxyphenyl)ethane (Methoxychlor)	No	CHF.
All other chlorinated insecticides, cyclic	No	DUP.
Organophosphorus insecticides:	Yes	
O-(2,4-Dichlorophenyl) O-ethyl S-propyl phosphorodithioate	No	CHG.
O-(2-(Diethylamino)-6-methyl (4-pyrimidinyl) O,O-dimethyl phosphrothioate	No	(2).
O,O-Diethyl O-[4-(methylsulfinyl)phenyl-] phosphorothioate	No	CHG.
O,O-Diethyl O-3,5,6-trichloro-2-pyridyl-phosphorothioate	No	DOW.

See footnotes at end of table.

Table 40—Continued

Pesticides and related products for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Pesticides and related products	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 41)*
Cyclic—Continued		
Insecticides—Continued		
Organophosphorus insecticides—Continued		
O,O-Dimethyl O-4-(methylthio)-m-tolyl-phosphorothioate (Fenthion)	No	CHG.
O,O-Dimethyl S-[(4-oxo-1,2,3-benzotriazin-3(3H)-yl)methyl]phosphorodithioate (Azinphos-methyl)	No	CHG, DUP.
O-Ethyl O-[4-(methylthio)phenyl] S-propyl phosphorodithioate	No	CHG.
N-(Mercaptomethyl)phthalimide S-(O,O-dimethylphosphorodithioate)	No	ICI.
O,O'-(Thiodi-4,1-phenylene)bis(O,O-dimethyl-phosphorothioate (Temphos)	No	ICI.
Rodenticides:	No	
3-(α-Acetonylbenzyl)-4-hydroxycoumarin (Warfarin)	No	MOT.
3-[3-(4'-Bromo[1,1'-biphenyl]-4-yl)-1,2,3,4-tetrahydro-1-naphthalenyl]-4-hydroxy-2H-1-benzopyran-2-one	No	LIL, (2).
2-Diphenylacetyl-1,3-indandione and sodium salt	No	MOT.
2-Isovaleryl-1,3-indandione	No	MOT.
2-Pivaloyl-1,3-indandione (Pindone)	No	MOT.
All other cyclic pesticides:	No	
Benzyl-2-chloro-4-(trifluoromethyl)-5-thiazolecarboxylate	No	MNA.
α-[2-(2-*n*-Butoxyethoxy)ethoxy]-4,5-methylenedioxy-2-propyltoluene (Piperonyl butoxide)	No	ALP, TNA.
N,N-diallyl-2,2-dichloroacetamide	No	ICI.
N-(2-Ethylhexyl)bicyclo(2.2.1)-5-heptene-2,3-dicarboximide	No	MGK.
1-Methyl-3,5,7-triaza-1-azonia tricyclodecane chloride	No	BKM.
2,2,5-Trimethyl-3-(dichloroacetyl)-1,3-oxazolidine	No	ICI.
All other pesticides and related products, cyclic	No	(2).
Acyclic:		
Fungicides:	Yes	
Bis-1,4-bromoacetoxy-2-butene	No	VIN.
Bis(tributyltin) oxide	No	(2).
1,2-Dibromo-2,4-dicyanobutane	No	MRK.
Disodium cyanodithioimidocarbonate	No	BKM.
n-Dodecylguanidine acetate (Dodine)	No	ACY.
Dodecylguanidine hydrochloride	No	MRK.
Methylenebis(thiocyanate)	No	MRK, VIN.
Poly[oxyethylene(dimethylimino)-ethylene (dimethylimino)ethylene dichloride]	No	BKM.
Tributyltin chloride	No	(2).
Dithiocarbamic acid fungicides:		
Dimethyldithiocarbamic acid, potassium salt	No	ALC, BKM.
Ethylene bis(dithiocarbamic acid), disodium salt (Nabam)	No	ALC, VCC.
Ethylene bis(dithiocarbamic acid), manganese salt with zinc ions	No	DUP.
Ethylene bis(dithiocarbamic acid), zinc and manganese salts	No	RH.
Hydroxymethyl(methyl)dithiocarbamic acid, potassium salt	No	BKM.
N-Methyldithiocarbamic acid, potassium salt	No	BKM.
Herbicides and plant growth regulators:	Yes	
2,2-Dichloropropionic acid,sodium salt (Dalapon)	No	DOW.
Dimethylarsinic acid (Cacodylic acid)	No	VIN.

See footnotes at end of table.

Table 40—Continued

Pesticides and related products for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Pesticides and related products	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 41)*
Acyclic—Continued		
Herbicides and plant growth regulator—Continued		
S-Ethyl diisobutylthiocarbamate (Butylate)	No	ICI, PPG, SOC.
S-Ethyl dipropylthiocarbamate (EPTC)	No	ICI, PPG, SOC.
Methanearsonic acid, disodium salt (DSMA)	No	VIN.
Methanearsonic acid, dodecyl- and octyl- ammonium salts	No	VIN.
Methanearsonic acid, monosodium salt (MSMA)	No	SDS, VIN.
Methylthiosulfonic acid, S-(2-hydroxypropyl) ester	No	BKM.
N-(Phosphonomethyl)glycine, isopropylamine salt	No	MNA.
S-Propyl butylethylthiocarbamate (Pebulate)	No	ICI.
S-Propyl dipropylthiocarbamate (Vernolate)	No	ICI.
Thiocyanic acid, methylene ester	No	BKM.
S,S,S-Tributyl phosphorotrithioate	No	CHG.
Plant growth regulators:		
6-Benzyledenine (BAP)	No	ABB.
N-(Phosphonomethyl)glycine, sodium sesqui salt	No	MNA.
All other plant growth regulators:	No	USR.
All other acyclic herbicides	No	DUP, VIN.
Insecticides:	No	
Ethyl 3,7,11-trimethyldodeca-2,4-dienoate	No	DOW, ZOC, (2).
Isopropyl-11-methoxy-3,7,11-trimethyldodeca-2, 4-dienoate	No	ZOC, (2).
Methyl N',N'-dimethyl-N-[(methylcarbamoyl)oxy-] -1-thiooxamidate	No	DUP.
S-Methyl-N-[(methylcarbamoyl)oxy]thioacetimidate (Methomyl)	No	DUP.
Organophosphorus insecticides:	Yes	
S-[1,2-Bis(ethoxycarbonyl)ethyl]O,O-dimethyl phosphorodithioate (Malathion)	No	ACY.
2-Carbomethoxy-1-propen-2-yl dimethyl phosphate	No	AMV, DUP.
1,2-Dibromo-2,2-dichloroethyl dimethyl phosphate (Naled)	No	AMV.
O,O-Diethyl S-[2-(ethylthio)ethyl]phosphorodithioate (Disulfoton)	No	CHG.
O,O-Diethyl S-[(ethylthio)methyl] phosphorodithioate (Phorate)	No	ACY.
3-(Dimethoxyphosphinyloxy)-N,N-dimethyl-cis-crotonamide	No	DUP.
O,S-Dimethylacetylphosphoramidothioate (Acephate)	No	SOC.
O,O-Dimethyl-O-2,2-dichlorovinyl phosphate (DDVP)	No	AMV.
S-[[(1,1-Dimethylethyl)thio]methyl]O,O-diethyl phosphorodithioate (Turbufos)	No	ACY.
Dimethyl phosphate of 3-hydroxy-N-methyl-cis-crotonamide	No	DUP.
O,S-Dimethyl phosphoramidothioate	No	CHG.
O-Ethyl S,S-di-sec-butyl phosphorodithioate	No	FMN, NES.
O,O,O',O'-Tetraethyl S,S'-methylene bisphosphoro-dithioate (Ethion)	No	FMN.
All other acyclic insecticides	No	SHC.
Rodenticides:	No	
2-Hydroxyethyl n-octyl sulfide	No	PLC.
Sodium fluoroacetate	No	TUL.
Soil fumigants:	No	
1,3-Dichloropropene	No	DOW.
Methyl bromide (Bromomethane)	No	GTL, TNA.
N-Methyldithiocarbamic acid, sodium salt (Metham)	No	AMV, BKM, CED, ICI.
Methyl isothiocyanate and 1,3-dichloropropene	No	MRT.
Trichloronitromethane (Chloropicrin)	No	LCP, NLO, TNA, WCL.
All other acyclic pesticides:	No	
3-Alkoxy-2-hydroxypropyl trimethyl ammonium chloride	No	(2).
N-Alkyl-1-naphthylmethyl ammonium chloride	No	ARS.
Ammonium oxydiethylenebis (alkly* dimethyl chloride) *Alkyl-40% C, 50% C, 10% C	No	BKM.

See footnotes at end of table.

Table 40—Continued

Pesticides and related products for which U.S. production and/or sales were reported, identified by manufacturer, 1988

Pesticides and related products	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 41)*
Acyclic—Continued		
All other acyclic pesticides—Continued		
Bromoacetic acid	No	VIN.
N-Cocoalkyl-1,3-propylenediamine acetate	No	([2]).
2-[(Hydroxymethyl)amino]-2-methylpropanol	No	TRO.
2-(Hydroxymethyl)ethanol	No	TRO.
3-Iodo-2-propynyl butylcarbamate	No	TRO.
All other pesticides and related products, acyclic	No	CWN, USR, ZOC, ([2]).

[1] Chemicals for which seperate statistics are reported in this section are indicated by 'Yes.' Chemicals for which data are accepted in confidence and may not be published are indicated by 'No.'
[2] The manufacturer did not consent to his identification with the disignated products.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 41
Pesticides and related products: Directory of manufacturers, alphabetical by code, 1988

Code	Name of company	Code	Name of company
ABB	Abbott Laboratories	LIL	Eli Lilly & Co.
ACY	American Cyanamid Co.	MCI	Mooney Chemical, Inc.
ADC	Anderson Development Co.	MGK	McLaughlin Gormley King Co.
ALC	Alco Chemical Corp.	MMM	Minnesota Mining & Manufacturing Co.
ALP	Alpha Laboratories, Inc.	MNA	Monsanto Agriculture Co.
AMV	Amvac Chemical Corp.	MOT	Motomco, Ltd.
BAS	BASF Corp.	MRF	Morflex Chemical Co., Inc.
BKM	Buckman Laboratories, Inc.	MRK	Merck & Co., Inc.
CCA	Akzo Chemicals, Inc.	MRT	Morton-Thiokol, Inc., Morton Chemical Div.
CED	Cedar Chemical Co.		
CGY	Ciba-Geigy Corp.	NES	Ruetgers-Nease Chemical Co.
CHF	Kincaid Enterprises, Inc.	NLO	Niklor Chemical Co., Inc.
CHG	Mobay Chemical Crop., Agricultural Chemicals Div.	NOD	Huls America, Inc.
		PAS	Pennwalt Corp.
COS	Cosan Chemical Corp.	PBI	PBI-Gordon Corp.
CWN	Upjohn Co., Fine Chemicals	PLC	Phillips 66 Co.
CYT	Cumberland International Corp.	PPG	PPG Industries, Inc.
DOW	Dow Chemical Co.	RH	Rohm & Haas Co.
DUP	E. I. duPont de Nemours & Co., Inc. Agricultural Products	RIV	Riverdale Chemical Co.
		SDS	Fermenta Plant Protection
FER	Ferro Corp., Ferro Chemical Div.	SHC	Shell Oil Co., Shell Chemical Co.
FMN	FMC Corp., Agricultural Chemical Group	SOC	Chevron Corp., Chevron Chemical Co.
		SOM	Southland Corp.
FMT	Fairmount Chemical Co., Inc.	TNA	Ethyl Corp.
FRI	Farmland Industries, Inc.	TRO	Troy Chemical Corp.
FRO	Vulcan Materials Co., Chemicals Div.	TUL	Tull Chemical Co., Inc.
GIV	Givaudan Corp.	USR	Uniroyal, Inc., Uniroyal Chemical Div.
GTH	Guth Corporation	VCC	Vinings Chemical Co.
GTL	Great Lakes Chemical Corp.	VEL	Velsicol Chemical Corp.
HCL	Hoescht Celanese Corp., Fine Chemicals, Div.	VIN	Vineland Chemical Co., Inc.
		VNC	Vanderbilt Chemical Corp.
ICI	ICI Americas Inc., Agricultural Chemicals Div.	WCL	Wright Chemical Corp.
		ZOC	Sandoz Crop Protection
LCP	LCP Chemicals-Maine		

Note.— Complete names, telephone numbers, and addresses of the above reporting companies are listed in app. A.
Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Section 14

Miscellaneous End-Use Chemicals and Chemical Products

This section incorporates those end-use groups which are not readily classifiable within the prior sections of this report. Both cyclic and acyclic chemicals fall within this section. Production and sales of the end-use chemicals contained within this section continue to follow a general increase since 1985.

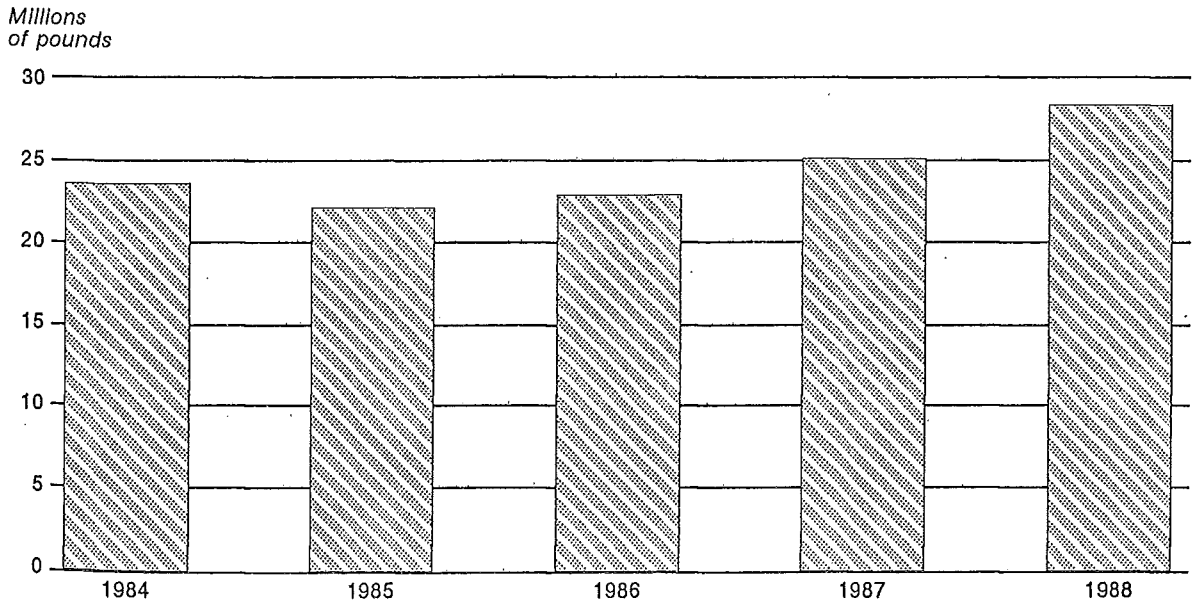
In 1988, the production of miscellaneous end-use chemicals amounted to 28,528 million pounds, an increase of 13.1 percent from the more than 25,223 million pounds of production reported for 1987. Production of these chemicals remained nearly level but steadily increasing throughout 1985–88 (figure 15). Sales in 1988 totaled 22,518 million pounds, valued at $9,449 million (table 42). The sales quantity increased 7.2 percent from that of 1987 with the value of sales increasing by 28.5 percent. Polymers for fibers and end uses of urea collectively accounted for 64.8 percent of the 1988 production of these miscellaneous end-use chemicals. The total published end-uses for urea accounted for 47.9 percent of the 1988 sales quantity of these chemicals.

Production of end-use chemicals used in the auto and motor fuels market indicated continued upward trends. Production of fuel additives for 1988 totaled 6,114 million pounds, an increase of 57.7 percent from the previous year. Approximately 92.9 percent of production in this category was methyl t-butyl ether. The increase of 61.6 percent in reported production from 1987 is due to the increasing end-uses of this chemical as an octane enhancer as well as an increase in the number of companies that had previously misstated production or failed legal reporting requirements.

Table 43 lists the products reported in this section and indicates the manufacturer(s) of each by code. These codes are identified by company name in table 44.

David G. Michels
202–252–1352

Figure 15
Miscellaneous End-Use Chemicals and Chemical Products: U.S. production, 1984–88



Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 42
Miscellaneous end-use chemicals and chemical products: U.S. production and sales, 1988

Miscellaneous end-use chemicals and chemical products	Production	Sales Quantity	Sales Value	Average Unit value[1]
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Grand total	28,527,873	22,518,071	9,448,536	$0.42
Chelating agents, nitriloacids and salts, total	276,302	214,838	137,129	.64
(Diethylenetrinitrilo)pentaacetic acid, pentasodium salt	16,286	15,942	9,900	.62
(Ethylenedinitrilo) tetraacetic acid (EDTA)	7,515	5,351	4,758	.89
(Ethylenedinitrilo)tetracetic acid, diammonium salt	3,222	2,171	1,318	.61
(Ethylenedinitrilo)tetraacetic acid, disodium copper salt, dihydrate	535	206	343	1.67
(Ethylenedinitrilo)tetraacetic acid, disodium salt	1,852	1,838	3,221	1.75
(Ethylenedinitrilo)tetraacetic acid, monosodium iron salt	2,106	1,940	2,717	1.40
(Ethylenedinitrilo)tetraacetic acid, tetrasodium salt	82,375	54,662	33,852	.62
(N-Hydroxyethylethylenedinitrilo)triacetic acid, trisodium salt	10,986	4,125	2,757	.67
All other chelating agents, nitriloacids and salts	151,425	128,603	78,263	.61
Chemical indicators	4	4	417	104.25
Chemical reagents and fine chemicals	485	433	33,197	76.67
Enzymes:				
Bacterial amylase	(2)	(2)	21,930	(2)
Pectinase	(2)	(2)	1,240	(2)
Proteases, total	(2)	(2)	40,102	(2)
Rennin	(2)	(2)	16,192	(2)
All other proteases	(2)	(2)	23,910	(2)
Flotation reagents	19,180	19,701	7,518	.38
Fuel additives, total[3]	6,114,019	4,813,892	1,303,669	.27
Methyl t-butyl ether[4 5]	5,679,953	4,493,960	951,277	.21
All other fuel additives	434,066	319,932	352,392	1.10
Lubricating oil and grease additives, total	667,794	577,000	403,853	.70
Oil soluble petroleum sulfonate, barium salt	8,671	8,563	7,354	.86
Oil soluble petroleum sulfonate, calcium salt	218,733	166,607	108,842	.65
All other lubricating oil and grease additives	440,390	401,830	287,657	.72
Paint driers, naphthenic acid salts, total[6 7]	7,525	7,299	11,075	1.52
Cobalt naphthenate	2,780	2,827	6,883	2.43
All other paint driers, naphthenic acid salts	4,745	4,472	4,192	.94
Photographic chemicals	18,669	8,274	48,263	5.83
Polymers for fibers, total[8]	6,819,814	3,630,338	4,753,634	1.31
Nylon 6 and 6/6[4 9]	2,450,025	(2)	(2)	(2)
Polyacrylonitrile and acrylonitrile copolymers[5]	566,509	(2)	(2)	(2)
All other polymers for fibers	3,803,280	3,630,338	4,753,634	1.31
Polymers, water soluble, total	696,039	614,382	672,472	1.10
Cellulose esters and ethers:				
Hydroxethylcellulose	32,869	(2)	(2)	(2)
Sodium carboxymethylcellulose	49,673	(2)	(2)	(2)
Polyacrylamide	(2)	37,484	39,998	1.07
Polyacrylic acid salts, total	250,206	218,931	205,348	.94
Sodium ammonium polyacrylate and copolymers	116,581	106,014	101,420	.96
All other polyacrylic acid salts	133,625	112,917	103,928	.92
All other water soluble polymers	363,291	357,967	427,126	1.19

See footnotes at end of table.

Table 42—Continued

Miscellaneous end-use chemicals and chemical products: U.S. production and sales, 1988

Miscellaneous end-use chemicals and chemical products	*Production*	*Sales*		*Average Unit value*[1]
		Quantity	*Value*	
	1,000 pounds	*1,000 pounds*	*1,000 dollars*	*Per pound*
Poly-α-olefins	139,015	133,854	137,351	$1.03
Tanning materials synthetic	39,274	25,735	19,738	.77
Textile chemicals, other than surface-active agents, total	78,442	55,664	42,735	.77
Urea polymers with formaldehyde and methanol	570	501	263	.53
All other textile chemicals, other than surface-active agents	77,872	55,163	42,472	.77
Urea in compounds or mixtures:				
In feed compounds	382,330	364,914	31,373	.09
In liquid fertilizer	2,556,005	2,111,403	282,093	.13
In solid fertilizer	8,724,077	8,080,520	480,779	.06
All other miscellaneous end-use chemicals and chemical products[9]	1,988,899	1,859,820	1,019,968	.55

[1] Calculated from unrounded figures.
[2] Reported data were accepted in confidence an may not be published, or no data were reported.
[3] Statistics exclude production and sales of tricresyl phosphate. Statistics on tricresyl phosphate are given with the section on "Plasticizers."
[4] The difference between the production reported here and that shown on the *Preliminary Report on U.S. Production of Selected Organic Chemicals (Including Synthetic Plastics and Resins Materials, 1988*, results from a combination of incorrect reporting by some companies, end-of-year inventory adjustment, and rounding.
[5] Production totals shown for this chemical include quarterly production data in instances where companies reported inaccurate annual data or failed to report annual data. Totals also include reporting by companies which failed to report on a quarterly basis.
[6] Quantities are given on the basis of solid naphthenate.
[7] Statistics exclude production and sales of copper naphthenate. Statistics for copper naphthenate are given in the section on "Pesticides and Related Products."
[8] Quarterly production data for polyethylene terephthalate are incorrect due to inaccurate reporting. Annual production figures cannot be published because disclosure would result.
[9] Production totals shown for this chemical include quarterly production in instances where annual data were determined to be inaccurate.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 43

Miscellaneous end-use chemicals and chemical products for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous end-use chemicals and chemical products	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 44)*
Amino acids and their salts:		
Aspartic acid	No	PFZ.
N,N-Bis(2,2-acetamido)glycine	No	PIC.
N,N-Dimethylglycine	No	MCK.
N,N-Dimethylglycine hydrochloride	No	MCK.
Glutamic acid hydrochloride	No	LEM.
Glycine (Aminoacetic acid), non-medical	No	CHT, HMP.
Phenyl alanine	No	NSW.
Potassium glutamate	No	LEM.
Methionine and its salts:		
Methionine (animal feed grade)	No	DGC.
Methionine, hydroxy analogue, calcium salt	No	MNA.
Protein hydrosylates	No	BRS.
Sarcosine	No	HMP.
All other amino acids and salts, cyclic	No	AJI, HCC.
Biological stains:		
Biological stains	No	ALD, EK.
Chelating agents, nitriloacids and salts:	Yes	
N-Alkylamine bismethylenephosphonic acid	No	DUP.
N-Alkylaminobismethylene phosphonic acid salts	No	([2]).
(Diethylenetriamine)pentamethylenephosphonic acid	No	MYO, OMC.
(Diethylenetriamine)pentamethylenephosphonic acid, sodium salt	No	MYO, OMC.
(Diethylenetrinitrilo)pentaacetic acid	No	CGY, DOW, HMP.
(Diethylenetrinitrilo)pentaacetic acid, monosodium hydrogen ferric salt	No	CGY.
(Diethylenetrinitrilo)pentaacetic acid, pentasodium salt	Yes	CGY, DOW, HMP.
N,N-Dihydroxyethylglycine, sodium salt	No	HMP.
Ethanoldiglycine, disodium salt	No	HMP.
(Ethylenedinitrilo)tetraacetic acid (Ethylenediaminetetraacetic acid) (EDTA)	Yes	CGY, DOW, HMP.
(Ethylenedinitrilo)tetraacetic acid, calcium disodium salt	No	CGY, DAN, DOW.
(Ethylenedinitrilo)tetraacetic acid, diammonium salt	Yes	CGY, DOW, HMP.
(Ethylenedinitrilo)tetraacetic acid, dipotassium salt	No	EK.
(Ethylenedinitrilo)tetraacetic acid, disodium copper salt, dihydrate	Yes	CGY, DAN, DOW, HMP, PLC.
(Ethylenedinitrilo)tetraacetic acid, disodium salt	Yes	CGY, DOW, HMP.
(Ethylenedinitrilo)tetraacetic acid, disodium zinc salt, dihydrate	No	CGY, DOW, HMP.
(Ethylenedinitrilo)tetraacetic acid, magnesium salt	No	SHC, TX.
(Ethylenedinitrilo)tetraacetic acid, manganese salt	No	CGY, HMP.
(Ethylenedinitrilo)tetraacetic acid, monoammonium ferric salt	No	DOW.
(Ethylenedinitrilo)tetraacetic acid, monosodium iron salt	Yes	CGY, FER, HMP.
(Ethylenedinitrilo)tetraacetic acid, tetraammonium salt	No	CGY, DOW.
(Ethylenedinitrilo)tetraacetic acid, tetrapotassium salt	No	HMP, ([2]).
(Ethylenedinitrilo)tetraacetic acid, tetrasodium salt	Yes	CGY, DOW, HMP.
(Ethylenedinitrilo)tetraacetic acid, trisodium salt	No	CGY, HMP, TX.
Glucoheptonic acid, β-isomer, sodium salt	No	BLZ.
Glucoheptonic acid, sodium salt	No	BLZ, PFN.
Hexamethylenediaminetetra(methylenephosphonic acid), potassium salt	No	MYO, OMC.
Hydroxyethane-1-diphosphonic acid	No	MYO.
(N-Hydroxyethylethylenedinitrilo)triacetic acid, iron salt	No	DOW, HMP.

See footnotes at end of table.

Table 43—Continued

Miscellaneous end-use chemicals and chemical products for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous end-use chemicals and chemical products	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 44)*
Chelating agents, nitriloacids and salts—Continued		
(N-Hydroxyethylethylenedinitrilo)triacetic acid, magnesium salt	No	DOW, HMP.
(N-Hydroxyethylethylenedinitrilo)triacetic acid, trisodium salt	Yes	CGY, DOW, HMP.
Hydroxyethylidene diphosphonic acid, potassium salt	No	(2).
Hydroxyethylidene diphosphonic acid, sodium salt	No	MYO, (2).
Nitriloacetic acid, zinc salt	No	HMP.
Nitrilotriacetic acid	No	HMP, MON.
Nitrilotriacetic acid, trisodium salt	No	HMP.
Nitrilo-tris-methylene triphosphonic acid	No	BKM, MYO, OMC, (2).
Nitrilo-tris-methylene triphosphonic acid, potassium salt	No	(2).
Nitrilo-tris-methylene triphosphonic acid, sodium salt	No	MYO, OMC, (2), (2).
2-Phosphonobutane-1,2,4-tricarboxylic acid, sodium salt	No	(2).
Polyamine polymethane phosphonic acid	No	(2), (2).
Polyamine polymethane phosphonic acid, magnesium salt	No	RPC.
All other chelating agents, nitriloacids and salts	No	BKM, CGY, HMP, OMC, SCP, (2).
Chemical indicators:		
Chemical indicators	Yes	ALD, EK, GFS.
Chemical reagents and fine chemicals:		
Chemical reagents and fine chemicals	Yes	ALD, EK, ENJ, GFS, HMY, PAH, PFN, PIC, PLB, REG, RSA, UPJ, UPM, (2).
Enzymes:	Yes	
Hydrolytic enzymes:		
Amylases:		
Bacterial amylase	Yes	GBF, GNR, MLS, NBI, PMP.
Glucoamylase	No	GBF, MLS, NBI.
Maltase	No	PFZ.
All other amylases	No	GBF, TX.
Proteases:		
Papain	No	GBF, PFZ.
Pepsin	No	CHH.
Protease (bacterial)	No	NBI.
Rennin	Yes	CHH, MLS, PFZ.
All other proteases	No	GBF, GNR, MLS, SPR.
Other hydrolytic enzymes:		
Cholesterol esterase	No	BCK, MLS.
Hydrolytic enzyme mixtures	No	JFR.
Lipase	No	CHH, GNR.
Pectinase	Yes	GBF, GNR, MLS.
Other hydrolytic enzymes	No	GNR, MLS, PMP, (2).
Non-hydrolytic enzymes:		
Cholesterol oxidase	No	BCK, UPJ.
Glucose oxidase	No	BCK.
Glucose-6-phosphate dehydrogenase	No	BCK.
Glycerol kinase	No	BCK.
Uricase	No	BCK.
Flotation reagents:	Yes	
Allyl n-butyl trithiocarbonate	No	CED.
Phosphorodithioates, used as flotation reagents:		
Dicresylphosphorodithioic acid	No	ACY, (2).
Dicresylphosphorodithioic acid, ammonium salt	No	ACY.
Dicresylphosphorodithioic acid, sodium salt	No	(2).
Rosin amines	No	HPC, SHX.
Sodium n-butylxanthate	No	USR.
Thiocarbanilide (Diphenylthiourea)	No	ACY.
Xanthates and sulfides, used as flotation reagent:		
All other flotation reagents	No	CXI, DAN, ELC, SHX, (2).

See footnotes at end of table.

Table 43—Continued

Miscellaneous end-use chemicals and chemical products for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous end-use chemicals and chemical products	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 44)*
Fuel additives:		
Diesel fuel additives:	Yes	
Hexyl nitrate	No	DUP.
All other diesel fuel additives, acyclic	No	TNA.
All other diesel fuel additives, cyclic	No	PAH.
Fuel oil additives:		
Adipic acid-diethylenetriamine-epichlorohydrin polymer	No	(2).
Di-tert-amyl-phenyl acid phosphate	No	ALW.
4,4'-Di-sec-butylaminodiphenylmethane	No	UPM.
N,N-Dimethyl-1,3-propanediamine polymer with epichlorohydrin, sulfate	No	(2).
N,N'-Disalicylidene-1,2-propanediamine	No	DUP, FER, SM, TNA.
Ethoxylated hydantoin glycol dicocoate	No	BRD.
Formaldehyde polymer with ethylenediamine and nonyl phenol derivatives	No	(2).
Imidazoline from tall oil fatty acids and diethylenetriamine	No	(2).
Methylene-bis(dimethyl)hydantoin and derivatives	No	BRD.
Mixed aryl diimides	No	SM.
Phenyl acid phosphate	No	HDG.
Polybutylether carbamate	No	SOC.
Poly(dimethylimino(2-hydroxytrimethylene)chloride)	No	(2).
Polyethylenepolyamine polymer with 1,4-dihyroxy-2-butyne	No	(2).
Rust preventing additives	No	ALX.
Tetrahydropyrimidine from tall oil fatty acids and propylenediamine	No	(2).
All other fuel additives, acyclic	No	DUP, SM, UPM, (2).
Gasoline additivies:		
N,N'-Di-sec-butyl-p-phenylenediamine	No	DUP, TNA, UPM.
N,N'-Diisopropyl-p-phenylenediamine	No	DUP, TNA.
Ethylene dibromide	No	GTL, TNA.
Methyl-t-amyl ether	No	CXI.
Methyl-t-butyl ether	Yes	AMO, ATR, CGO, CO(E), CSD, CSP, DA, ENJ, GRS, LYP, PLC, SOG, SUN, TPC, TX, VLR.
Methylcyclopentadienylmanganese tricarbonyl	No	TNA.
N-(1-Methylheptyl)ethanolamine	No	UPM.
Tetraethyl lead	No	DUP.
All other gasoline additives, acyclic	No	TNA, TX, UPM, (2).
All other gasoline additives, cyclic	No	VNC, (2).
Lubricating oil and grease additives:	Yes	
Chlorosulfurizer and sulfurized compounds:		
Chlorosulfurized sperm oil	No	ELC.
Sulfurized lard oil	No	CCW, QCP.
Sulfurized sperm oil substitutes	No	CCW, ELC.
Dodecyl succinic anhydride	No	TX.
Hydrocarbon carboxylic acid derivatives	No	EMR, (2), (2), (2).
Hydrocarbon phosphorous acid, barium salt	No	(2).
Hydrocarbon phosphoryl derivatives	No	(2).
Methylene-bridged polyalkyl phenols	No	TX.
Oleyl acid phosphate	No	FER.
Oxidized hydrocarbon mixture	No	ALX, ELC.
Oil-soluble petroleum sulfonates:		
Oil-soluble petroleum sulfonate, ammonium salt	No	ENJ.
Oil-soluble petroleum sulfonate, barium salt	Yes	PAR, TNA, WTC, (2).
Oil-soluble petroleum sulfonate, calcium salt	Yes	PAR, SOC, TNA, TX, WTC, (2).
Oil-soluble petroleum sulfonate, magnesium salt	No	WTC, (2).
Oil-soluble petroleum sulfonate, sodium salt	No	GAF, PAR.
All other oil-soluble petroleum sulfonate	No	DUP, MON, SOC.

See footnotes at end of table.

Table 43—Continued

Miscellaneous end-use chemicals and chemical products for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous end-use chemicals and chemical products	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 44)*
Lubricating oil and grease additives—Continued		
Phenol salts:		
Alkyl phenols	No	(2).
Dodecylphenol, sulfurized, calcium salt	No	SOC.
Nonylphenol, barium salt	No	CCA, FER, WTC.
All other phenol salts	No	TNA.
Phosphorodithioates (dithiophosphates):		
Alkene thiophosphonate	No	TX.
Alkyl imidazoline	No	(2).
Alkyl succinic anhydride	No	SM, TNA.
Alkyl terephthalamate	No	SOC.
Bis(1,3-Dimethylbutyl)phosphorodithioate oleyl amine salt	No	ELC.
Bornyl phenylamine	No	SOC.
Di-2-ethylhexylphosphorodithioic acid	No	ELC.
Di-N-propylphosphorodithioic acid	No	ELC.
Diisopropyl hydrogen phosphite	No	ALW.
Dimer acid esters and polyesters	No	EMR.
Dodecenyl succinic acid, benzotriazole salt	No	SM.
Dodecylphenyl-α-naphthylamine	No	SM.
Dodecylphenyl-α-naphthylamine, dioctyl diphenylamine co-polymer	No	SM.
Ethylene-propylene copolymer	No	TX.
Fatty acid polyamine condensate	No	SOC.
Mixed polyesters	No	HCC.
Modified ethylene-propyene copolymers	No	TX.
Pentaerythritol esters	No	HCC.
Polyisobutenyl succinic anhydride	No	TX.
1,3,4-Thiadiazole, 2,5-bis(dialkyldithio) derivatives	No	ELC.
Tributyl phosphite	No	ALW.
Trimethylol propane ester	No	EMR, HCC, QCP.
Very high molecular weight (>1000) hydrocarbons	No	(2).
Zinc dialkyldithiophosphate	No	ELC, SOC, TNA, TX.
Zinc dialkylphenol dithiophosphate	No	SOC.
Zinc dibutyl phosphorodithioate	No	ELC.
Zinc hydrocarbon dithiophosphate	No	(2).
All other phosphorodithioates used as lubricating oil and grease additives	No	ELC, (2).
Succinimides:		
Alkenyl succinimide	No	SOC, TNA, TX, (2).
Dodecenyl-acetic succinimide	No	SM.
Sulfur compounds:		
Aliphatic hydrocarbon sulfides	No	ELC, FER, (2).
Di-tertiary nonylpolysulfide	No	PAS.
Trisobutylene polysulfide	No	TX.
All other sulfur compounds	No	FER, QCP, TNA, WBG, (2).
All other lubricating oil and grease additives, acyclic	No	ALW, DUP, ELC, QCP, QCP, SM, TNA, TX, (2), (2), (2).
All other lubricating oil and grease additives, cyclic	No	(CGY, ENJ, SCP, SM, TNA, TX, (2).
Paint driers, naphthenic acid salts:	Yes	
Barium naphthenate	No	(2).
Cadmium naphthenate	No	CCA.
Calcium naphthenate	No	CCA, MCI, NOD, TRO.
Chromium naphthenate	No	MCI.
Cobalt naphthenate	Yes	CCA, MCI, NOD, SHP, TRO.
Copper naphthenate	No	NOD.
Iron naphthenate	No	CCA, MCI, NOD.
Lead naphthenate	No	CCA, MCI, NOD, TRO.
Lithium naphthenate	No	CCA.

See footnotes at end of table.

Table 43—Continued

Miscellaneous end-use chemicals and chemical products for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous end-use chemicals and chemical products	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 44)*
Paint driers, naphthenic acid salts—Continued		
Manganese naphthenate	No	CCA, MCI, NOD.
Naphthenate driers, mixed salts	No	MCI.
Rare earths naphthenate	No	CCA, NOD.
Strontium naphthenate	No	CCA.
Zinc naphthenate	No	CCA, MCI, NOD, TRO.
Photographic chemicals:	Yes	
N-2-(4-Amino-N-ethyl-m-toluidino)ethyl methane-sulfonamide	No	WAY.
2-Amino-5-mercapto-1,3,4-thiadiazole	No	CCC.
Aryl alkyl polyether alcohol	No	DIX(E).
5-Chlorobenzotriazole	No	FMT.
4-Diazo-2,5-diethoxymorpholinobenzene	No	ALL.
2,5-Diethoxy-4-morpholinobenzenediazonium chloride	No	ALL.
p-Diethylaminobenzenediazonium chloride (p-Diazo-N, N-diethylaniline zinc chloride)	No	ALL, ESA.
p-Dimethylaminobenzenediazonium chloride (p-Diazo-N, N-dimethylaniline zinc chloride)	No	ALL, ESA.
p-[Ethyl(2-hydroxyethyl)amino]benzenediazonium chloride (p-diazo-n-hydroxyethylaniline zinc chloride)	No	ALL, ESA.
(N-Ethyl-N-(2-hydroxyethyl)-3-methyldehydrogen sulfate)p-phenylenediamine	No	(2).
N-Ethyl-N-hydroxyethyl-p-phenylenediamine sulfate	No	WAY.
Hydroquinone (Hydroquinol)	No	EKT.
4-Hydroxymethyl-4-methyl-1-phenyl-3-pyrazolidone	No	(2).
p-Methylaminophenol sulfate (Metol)	No	EK.
5-Methyl-1,7-dihydroxy-1,3,4-triazaindolizine	No	FMT.
3-Methyl-N-[2(methylsulfonamidoethyl)-N-ethyl-p-phenylenediamine]sequisulfate monohydrate	No	(2).
4-Methyl-1-phenyl-3-pyrazolidione	No	CWN.
p-Morpholinyl-2,5-dibutoxybenzene diazonium chloride	No	ALL.
5-Nitrobenzimidazole nitrate	No	EK.
Phenyl-5-mercaptotetrazole	No	FMT.
1-Phenyl-3-pyrazolidone	No	CWN.
Poly(vinyl-O-sulfobenzal)	No	DUP.
4-N-(1-Pyrrolidyl)-m-toluenediazonium chloride	No	ALL.
All other photographic chemicals	No	ARN, COC, DUP, ESA, FMT, WAY, (2), (2).
Polymers for fibers:	Yes	
Cellulose acetate	No	EKT, HCL, MIL.
Copolyurethane urea	No	DUP.
Linear saturated polyester	No	EKT.
Nylon 6 and 6/6:	Yes	
Nylon 6 (polymer for fiber, only)	No	ACS, SKP, (2).
Nylon 6/6	No	DUP, MON, SKP.
Polyacrylonitrile and acrylonitrile copolymers	Yes	ACY, BKM, DUP, MON.
Polyethylene terephthalate	No	DUP, EKT, FRF, GYR.
Poly-m-phenylene isophthalamide	No	DUP.
Poly-p-phenylene terephthalamide	No	DUP.
All other polymers for fibers	No	HCL, QCP.
Polymers, water soluble:	Yes	
Acrylamide polymers and co-polymers:		
Acrylamide-2-acrylamido-2-methylpropanesulfonic acid, sodium salt polymer	No	ENJ, (2).
Acrylamide-acrylic acid copolymer, potassium salt	No	(2).
Acrylamide-acrylic acid copolymer, sodium salt	No	BKM, (2).
Acrylamide N-dimethylaminomethylacrylamide copolymer	No	BKM.
Acrylamide-trimethylaminoethyl acrylate chloride polymer	No	(2).

See footnotes at end of table.

Table 43—Continued

Miscellaneous end-use chemicals and chemical products for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous end-use chemicals and chemical products	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 44)*
Polymers, water soluble—Continued		
Acrylamide polymers and co-polymers—Continued		
Acrylamide-trimethylaminoethyl methacrylate chloride	No	(2).
Adipic acid-crosslinked polycrylamide	No	BKM, ENJ, HCL, (2).
Polyacrylamide	Yes	ACY, DOW, ENJ, MRK, SQA, (2).
All other polyacrylamide copolymers	No	HCL, (2).
Cellulose esters and ethers:		
Hydroxyethylcellulose	Yes	AQU, DOW, UCC.
Hydroxyethyl hydroxypropyl cellulose	No	(2).
2-Hydroxypropyl cellulose	No	AQU.
Methylcellulose	No	DOW, UPJ.
Sodium carboxymethylcellulose (100%)	Yes	AQU, CBC, LCS, MAK.
Sodium carboxymethyl amylose	No	CCL.
Sodium carboxymethyl starch	No	(2).
All other cellulose ethers and esters	No	AQU, S, UCC, (2).
Dimethylamine epichlorohydrin ethylenediamine copolymer	No	(2).
Ethyl acrylate methacrylic acid copolymer	No	ALC.
Hydroxypropyl guar gum	No	AQU.
Poly(acrylic acid, ethyl ester)	No	DUP.
Poly(acrylic acid, methyl ester/ethylene/1,1-dichlorosuccinic acid, methylene-) with ethyl acrylate	No	DUP.
Polyacrylic acid salts:	Yes	
Ammonium polyacrylate	No	CCL, RH, (2), (2), (2).
Polyacrylate methacrylate copolymers	No	RH, (2).
Polyacrylate poly(hydroxypropylacrylate) copolymer	No	(2).
Polyacrylic acid	No	MYO, (2), (2).
Sodium ammonium polyacrylate and copolymers	Yes	ALC, BAS, BFG, RH, (2), (2).
Sodium polyacrylate	No	BKM, DOW, EFH, MYO, SYT, (2).
All other polyacrylic acid salts	No	ACY, BFG, ENJ, (2), (2), (2).
Polyacrylonitrile, hydrolyzed	No	BKM, DIX(E), RH.
Polyacrylonitrile, starch hydrolized polymer	No	GPC.
Polyamines	No	ENJ, (2).
Polydextrose	No	PFZ.
Poly(diallyldimethylammonium chloride	No	CPS, MRK, (2).
Polyethyleneimine	No	DAN.
Polymethacrylic acid, sodium salt	No	ALC, CPS, PFN.
Poly(1,1'-(methylimino)bis(3-chloro-2-propanol)-tetramethylethylenediamine	No	BKM.
Trimethylaminoethyl acrylate chloride polymer	No	(2).
1-Vinyl-2-pyrrolidinone, polymers	No	CCL, DAN, GAF, (2).
Xanthan gum	No	PFZ.
All other polymers, water soluble	No	BKM, DAN, EFH, PRA, RH, RPC, SYT, (2), (2), (2), (2).
Poly-α-olefins:	Yes	
Poly-α-olefins	No	CO, SM, SOC.
Poly-α-olefins, sulfurized	No	SM.
Rare sugars:		
D-Galactose	No	PFN.
D-Maltose	No	PFN.
Silicone greases:		
Silicone greases	No	DCC, SPD, SWS.
Tanning materials, synthetic:	Yes	
1-Naphthalenesulfonic acid, formaldehyde condensate and salt	No	RH.
2-Naphthalenesulfonic acid, formaldehyde condensate and salt	No	GRD.

See footnotes at end of table.

Table 43—Continued

Miscellaneous end-use chemicals and chemical products for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous end-use chemicals and chemical products	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 44)*
Tanning materials, synthetic—Continued	Yes	
1-Phenol-2-sulfonic acid, formaldehyde condensate (Phenol-formaldehyde, sulfonated)	No	BAS, RH.
Polyoxyalkylated cyclic amines	No	MIL.
All other tanning materials, synthetic	No	BAS.
Textile chemicals, other than surface active agents:	Yes	
Dicyanodiamide formaldehyde ammonium chloride polymer	No	CCC, CRT, DAN.
Dimethyloldihydroxyethylene urea	No	ACY, CCC, CHP, DAN, SYT.
Formaldehyde polymer with carbamate esters	No	SYT.
Lauryl alkyl dimethylamine acetate	No	(2).
Lauryl alkyl dimethylamine phosphate	No	(2).
Melamine formaldehyde methanol polymer	No	ACY, CCC, CRT.
Melamine formaldehyde copolymer	No	ENJ.
Melamine stearyl alcohol polymer	No	SYT.
Phenol, sulfurated	No	EMR.
Propoxylated starches	No	SYT.
2,2',4,4'-Tetrahydroxybenzophenone	No	BAS.
Urea polymers with formaldehyde and methanol	Yes	ACY, BAS, CCC, CRT, SYT.
Urea, polymer with tetrakishydroxymethylphosphonium sulfate	No	CHP.
All other textile chemicals, other than surface active agents,	No	BAS, CCL, DUP, ENJ, GAF, JSC, PAT, RPC, S.
Urea in compounds or mixtures (100% basis):		
Urea in feed compounds (100% basis)	Yes	APD, BNP, CAC, EMR, SOH, TER, TRI, WYC.
Urea in liquid fertilizer (100% basis)	Yes	ARM, BNP, CFI, CHN, CNC, FRI, HKY, MSC, SMP, SOC, SOH, TER, TRI, TVA, UOC, (2).
Urea in plastics (100% basis)	No	OMC, SOH, TRI.
Urea in solid fertilizer (100% basis)	Yes	APD, CAC, CFI, CNC, FRI, GCC, MSC, OMC, SOH, TER, TRI, TVA, UOC, WLC, WYC.

[1] Chemicals for which separate statistics are reported in this section are indicated by 'Yes.' Chemicals for which data are accepted in confidence and may not be published are indicated by 'No.'
[2] The manufacturer did not consent to his identification with the designated products.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 44

Miscellaneous end-use chemicals and chemical products: Directory of manufacturers, alphabetical by code, 1988

Code	*Name of company*
ACS	Allied Signal, Inc. Engineered Materials Sector
ACY	American Cyanamid Co.
AJI	Ajinomoto USA, Inc.
ALC	Alco Chemical Corp.
ALD	Aldrich Chemical Co., Inc.
ALL	Alliance Chemical, Inc.
ALW	Albright & Wilson, Inc.
ALX	Alox Corp.
AMO	Amoco Corp.
APD	Atlas Powder Co. Sub. of Tyler Corp.
AQU	Aqualon
ARM	LaRoche Industries Inc.
ARN	Arenol Chemical Corp.
ATR	Atlantic Richfield Co., Arco Chemical Co.
BAS	BASF Corp.
BCK	Beckman Instruments, Inc., Diagnostics System Group
BFG	B. F. Goodrich Co., B.F. Goodrich Chemical Group
BKM	Buckman Laboratories, Inc.
BLZ	Belzak Corp.
BNP	Bison Nitrogen Products Co.
BRD	Lonza, Inc.
BRS	Bristol-Myers Co.
CAC	Cominco Fertilizers Inc.
CBC	Carbose Corp.
CCA	Akzo Chemicals, Inc.
CCC	C.N.C. International, Inc.
CCL	Catawba-Charlab, Inc.
CCW	Morton-Thiokol, Inc., Carstab Div.
CED	Cedar Chemical Co.
CFI	CF Industries, Inc.
CGY	Ciba-Geigy Corp.
CHH	CHR. Hansen's Laboratory, Inc.
CHN	Wil-Gro Fertilizer, Inc.
CHP	C. H. Patrick & Co., Inc.
CHT	Chattem, Inc.
CNC	Columbia Nitrogen Corp.
CO	Conoco Specialty Products, Inc.
COC	Columbia Organic Chemical Co., Inc.
CPS	CPS Chemical Co., Inc.
CRT	Chemos Corp.
CSD	Fina Oil & Chemical Co., Cosden Chemical Div.
CSP	Coastal Refining & Marketing, Inc.
CWN	Upjohn Co., Fine Chemicals
CXI	Chemical Exchange Industries, Inc.
DAN	Dan River, Inc., Chemical Products Div.
DCC	Dow Corning Corp.
DGC	Degussa Corp.
DIX	Dixie Chemical Co., Inc.
DOW	Dow Chemical Co.
DUP	E. I. duPont de Nemours & Co., Inc. Chemicals and Pigments Dept. ED/IMG Dept. Textile Fibers Dept.
EFH	E.F. Houghton Co.
EK	Eastman Kodak Co.:
EKT	Tennessee Eastman Co. Div.
ELC	Elco Corp. Sub. of Detrex Chemical Industries, Inc.
EMR	Quantum Chemical Corporation, Emery Div.
ENJ	Exxon Chemical Americas
ESA	East Shore Chemical Co.
FER	Ferro Corp.: Ferro Chemical Div. Keil Chemical Div.
FMT	Fairmount Chemical Co., Inc.
FRF	Firestone Tire & Rubber Co., Firestone Fibers & Textiles Co.
FRI	Farmland Industries, Inc.
GAF	GAF Corp., Chemical Group.
GBF	International Bio-Synthetics, Inc.
GCC	Western Branch Holding Company
GFS	G. Frederick Smith Chemical Co.
GNR	Genencor, Inc.
GPC	Grain Processing Corp.
GRD	W. R. Grace & Co., Polymers & Chemical Div.
GTL	Great Lakes Chemical Corp.
GYR	Goodyear Tire & Rubber Co.
HCC	Hatco Chemical Corp.
HCL	Hoechst Celanese Corp: Hoechst Celanese Fibers. Sou-Tex Works.
HDG	Hodag Chemical Corp.
HKY	Hawkeye Chemical Co.
HMP	W. R. Grace & Co., Hampshire Chemical Div.
HMY	Humphrey Chemical Co.
HPC	Hercules, Inc.
JFR	George A. Jeffreys & Co., Inc.
JSC	Sybron Chemicals, Inc.
LCS	Louisiana Chemical Polymers, Inc.
LEM	Napp Chemicals, Inc.
LYP	Lyondell Petrochemical Co.
MAK	MAK Chemical Corp.
MCI	Mooney Chemicals, Inc.
MCK	MacKenzie Chemical Works, Inc.
MIL	Milliken & Co., Milliken Chemical Div.
MLS	Miles Laboratories, Inc., Biotechnology Group.
MNA	Monsanto Agricultural Co.
MON	Monsanto Co.
MRK	Merck & Co., Inc.
MSC	Mississippi Chemical Corp.
MYO	Mayo Chemical Co.
NBI	Novo Biochemical Industries, Inc.
NOD	Huls, America, Inc.
NSW	NutraSweet Co.
OMC	Olin Corp.

Table 44

Miscellaneous end-use chemicals and chemical products: Directory of manufacturers, alphabetical by code, 1988

Code	Name of company	Code	Name of company
PAH	Parish Chemical Co.	SOH	BP ChemicaLs America
PAR	Pennzoil Co., Penreco Div.	SPD	General Electric Co., Silicone Products Dept.
PAS	Pennwalt Corp.		
PAT	Pat-Chem Inc.	SPR	Scientific Protein Laboratories
PFN	Pfanstiehl Laboratories, Inc.	SQA	Segua Chemicals, Inc.
PFZ	Pfizer, Inc.	SWS	Wacker Silicone
PIC	Pierce Chemical Co.	SYT	Synthron, Inc.
PLB	Pharmacia P-L Biochemicals, Inc.	TER	Terra International, Inc.
PLC	Phillips 66 Co.	TER	Terra Nitrogen, Inc.
PMP	PMP Fermentation Products, Inc.	TNA	Ethyl Corp.
PRA	Para-Chem Southern	TPC	Texas Petrochemical Corp.
QCP	Quaker Chemical Corp.	TRI	Triad Chemical
REG	Regis Chemical Co.	TRO	Troy Chemical Corp.
RH	Rohm & Haas Co.	TVA	Tennessee Valley Authority
RPC	Colloids, Inc.	TX	Texaco, Inc., Texaco Chemical Co.
RSA	R.S.A. Corp.	UCC	Union Carbide Corp.
S	Sandoz, Inc., Colors & Chemicals Div.	UOC	Union Oil Co. of California
SCP	Henkel Corp.	UPJ	Upjohn Co.
SHC	Shell Oil Co., Shell Chemical Co.	UPM	U.O.P. Inc.
SHP	Shepherd Chemical Co.	USR	Uniroyal, Inc., Uniroyal Chemical Div.
SHX	Sherex Chemical Co., Inc.	VLR	Valero Refining Company
SKP	Shakespeare Co., Monofilament Div.	VNC	Vanderbilt Chemical Corp.
SM	Mobil Oil Corp., Mobil Chemical Co., Chemical Products Div.	WAY	Olin Hunt Specialty Products, Inc.
		WBG	White & Bagley Co.
SMP	J. R. Simplot Co.	WLC	Freeport-McMoran Resource Partners
SOC	Chevron Corp., Chevron Chemical Co.	WTC	Witco Chemical Corp.
SOG	Hill Petroleum Company	WYC	Wycon Chemical Co.

Note.—Complete names, telephone numbers, and addresses of the above reporting companies are listed in table 1 of the appendix.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Section 15

Miscellaneous Cyclic and Acyclic Chemicals

The term "miscellaneous chemicals" as it is used here comprises those synthetic organic products that are not included in the use groups covered by sections I–XIV of this report. They include products that are employed in a great variety of applications. The number of chemicals used extensively for only one purpose is not large. Among the products covered in this section are those used for refrigerants, aerosols, solvents, catalysts, additives in plastics and food products, and, especially, a wide range of acyclic chemical intermediates.

Figure 16 shows the trend of production of miscellaneous chemicals during 1984–88, and shows there has been a steady rate of increase since 1984. However, only the 1988 production of 105.9 billion pounds was higher than the previous all-time peak of 98.8 billion pounds produced in 1979.

U.S. production of miscellaneous cyclic and acyclic chemicals in 1988 amounted to 105.9 billion pounds, an increase of 8.0 percent compared with production in 1987 (Table 45). Production of miscellaneous cyclic chemicals comprised only 3.1 percent of this section's total production.

Because most of the production of miscellaneous chemicals is used internally by their producers to make more advanced intermediates and other chemical products, their sales are much smaller than their production. In 1988, sales of miscellaneous chemicals were 42.2 billion pounds, valued at $15.1 billion, compared with 40.3 billion pounds, valued at $12.0 billion, in 1987. The increase in sales quantity in 1988 was 4.7 percent. Moreover, with continuing increases in prices, the value of sales in 1988 was 25.6 percent greater than in 1987.

Oxygenated hydrocarbons accounted for about 61 percent of the production of all acyclic miscellaneous chemicals. Production of oxygenated hydrocarbons, which include organic acids, alcohols (the largest group), ketones, esters, ethers, aldehydes, epoxides, and other chemicals, increased from 58.9 billion pounds in 1987 to 62.4 billion pounds in 1988, or by 5.9 percent.

Slightly larger in volume than the alcohols in miscellaneous acyclic chemicals is the halogenated hydrocarbons group. Production of halogenated hydrocarbons was more than 28 billion pounds in 1988, about 2.5 billion pounds more than in 1987. Production of chlorinated hydrocarbons, by far the largest segment of this group, was 27.0 billion pounds in 1988, compared with 24.7 billion pounds in 1987. The overall increase in this group in 1987–88 hides larger changes in many of its constituent chemicals: There was increased production of methyl chloride (up 60 percent), carbon tetrachloride (up 13 percent), chloroform (up 13 percent), vinyl chloride (up 8 percent), ethylene dichloride (up 7 percent), perchloroethylene (up 5 percent); and 1,1,1-trichloroethane (up 4 percent). Fluorinated hydrocarbons production was 1.37 billion pounds in 1988, up 18.3 percent compared with production in 1987. Production of the three major chlorofluorocarbons—F–11, F–12, and F–22—was more than 20 percent higher than in 1987. Production of brominated chemicals, on the other hand, dropped in 1988 (as it had in 1987), down 18.6 percent from the previous year.

The second largest individual group of miscellaneous acyclic chemicals is monohydric alcohols (which had double the production of polyhydric alchols); their production was 16.6 billion pounds in 1988, an increase of 8.5 percent over 1987, which followed a greater increase the year before. The greatest growth in production in 1988 was attained by the butyl alcohols (up 19 percent), 2-ethylhexanol (up 12 percent), and methanol (up 8 percent). Mixtures of alcohols, however, dropped in volume in 1988.

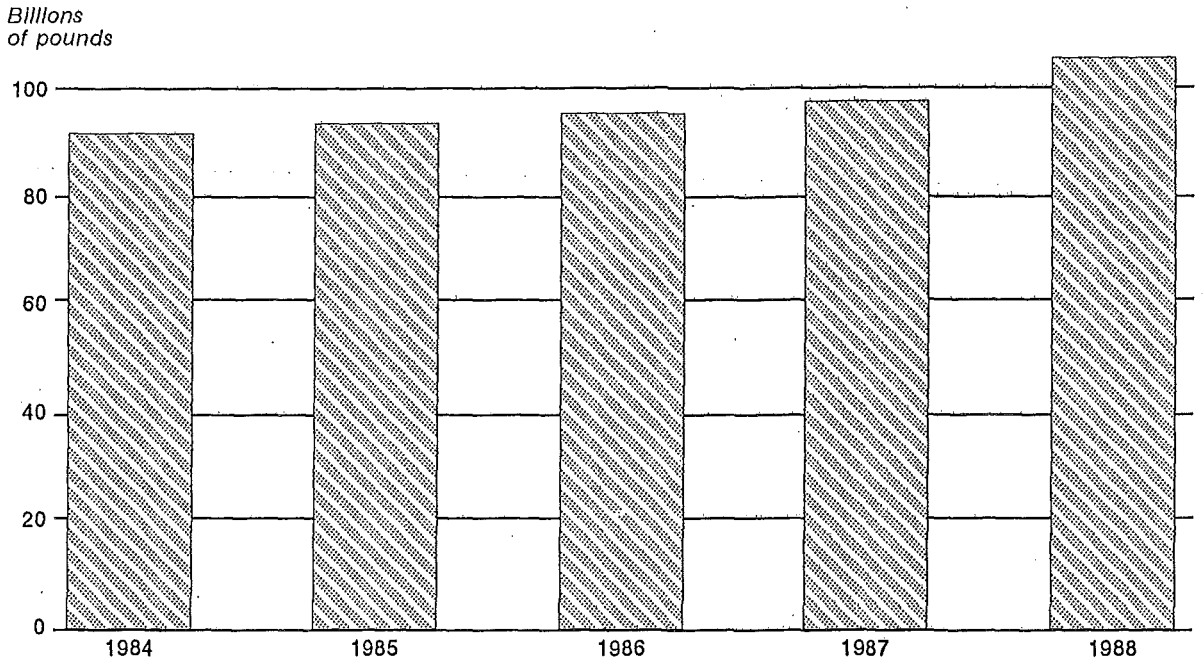
Virtually in a tie for third place among miscellaneous acyclic chemicals, each with production close to 9 billion pounds in 1988, are nitrogenous compounds, acids and anhydrides, and aldehydes. Mainly because of decreases in acetic and acrylic acids, production of acids and anhydrides was 3.8 percent less than in 1987. Production of aldehydes was 3.8 percent greater than in 1987, led by an increase for formaldehyde of 9.6 percent. Production of nitrogenous chemicals was 4.1 percent greater than in 1987. Production of the large "all other" group of nitrogenous chemicals increased by 30 percent in 1988, and that of the amines by 5 percent, but there were small decreases in production of the amides, the ethanolamines, and the nitriles.

There were a few other large increases in 1988 of major chemicals; namely, the increase of 41.3 percent in production of vinyl acetate to 2.56 billion pounds in 1988, and increases of 24.4 percent for ethylene oxide, 18.9 percent for ethyl acetate, and 6.4 percent for ethylene glycol.

Table 46 lists the products in this section individually identified by manufacturer(s) codes. Table 47 lists those codes alphabetically and identifies the manufacturer by name.

Aimison Jonnard
202–252–1350

Figure 16
Miscellaneous cyclic and acyclic chemicals: U.S. production, 1984-88



Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 45

Miscellaneous cyclic and acyclic chemicals: U.S. production and sales, 1988

Miscellaneous cyclic and acyclic chemicals	*Production*	*Sales*		*Average Unit value*[1]
		Quantity	*Value*	
	1,000 pounds	*1,000 pounds*	*1,000 dollars*	*Per pound*
Grand total	105,922,869	42,211,980	15,117,535	$0.36
Cyclic				
Total	3,272,790	1,521,560	1,747,959	1.15
Benzoic acid esters, total	3,344	(2)	(2)	(2)
Butyl benzoate	(2)	1,058	783	.74
Benzoic acid salts	(2)	25,639	16,440	.64
Benzoyl peroxide	10,253	8,688	20,531	2.36
Caprolactam	1,261,265	367,583	234,495	.64
Cumene hydroperoxide	3,577	3,283	1,819	.55
Hexamethylenetetramine, tech	89,289	(2)	(2)	(2)
Lactones	110,149	21,750	22,854	1.05
Maleic anhydride	448,433	357,897	153,674	.43
Morpholine	(2)	26,358	17,118	.65
Pinene and derivatives, total	345,734	44,491	20,013	.45
β-Pinene	37,880	(2)	(2)	(2)
Pine oil, natural sulfate	5,873	4,689	1,568	.33
All other	301,981	39,802	18,445	.46
Succinic anhydride derivatives	18,986	17,721	16,449	.93
Tall oil salts (Linoleic-rosin acid salts)	1,877	1,422	2,267	1.59
All other miscellaneous cyclic chemicals	979,883	645,670	1,241,516	1.92
Acyclic				
Total	102,650,079	40,690,420	13,369,576	.33
Nitrogenous compounds Total	9,146,687	3,367,161	1,723,726	.51
Amides, total	286,222	153,630	113,406	.74
N,N'-Ethylenebis-oleamide	442	469	600	1.28
N,N'-Ethylenebis-stearamide	45,187	33,495	22,351	.67
Oleamide (Octadecene amide)	3,704	3,273	3,795	1.16
All other amides	236,889	116,393	86,660	.74
Amines, total[3]	1,829,202	621,515	419,676	.68
Butylamines, total	29,881	24,349	17,819	.73
Ethylenediamine	78,535	62,316	45,508	.73
Isopropylamine, mono-	(2)	57,814	22,467	.39
Dimethylamine	99,270	74,658	24,938	.33
Trimethylamine	42,795	38,535	12,333	.32
All other amines	1,578,721	363,843	296,611	.83
2-Dimethylaminoethanol (N,N-Dimethylethanolamine)	(2)	20,884	15,959	.76
Ethanolamines, total	608,233	482,394	189,843	.39
2,2'-Aminodiethanol (Diethanolamine)	190,645	159,872	61,561	.38
2-Aminoethanol (Monoethanolamine)	216,767	146,762	57,309	.39
2,2',2''-Nitrilotriethanol (Triethanolamine)	200,821	175,760	70,973	.40

See footnotes at end of table.

Table 45—Continued

Miscellaneous cyclic and acyclic chemicals: U.S. production and sales, 1988

Miscellaneous cyclic and acyclic chemicals	Production	Sales		Average Unit value[1]
		Quantity	Value	
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Acyclic—Continued				
Nitrogenous compounds—Continued				
Nitriles, total	5,051,605	1,828,094	673,101	$0.37
Acetonitrile	34,774	(2)	(2)	(2)
Acrylonitrile	2,608,829	1,584,302	588,983	.37
2-Methyllactonitrile (Acetone cyanohydrin)	1,306,448	(2)	(2)	(2)
All other nitriles	1,101,554	243,792	84,118	.34
All other nitrogenous compounds	1,371,425	260,644	311,741	1.20
Acids, acyl halides and anhydrides				
Total	8,953,655	2,358,745	1,015,068	.43
Acetic acid, synthetic, 100%[4]	3,159,457	783,753	131,912	.17
Acrylic acid[4]	1,068,834	236,090	113,544	.48
2-Ethylhexanoyl chloride	2,438	(2)	(2)	(2)
Fatty acids, hydrogenated	336,377	279,815	93,178	.33
Fatty acids, non-hydrogenated	(2)	17,811	6,853	.38
Fumaric acid	(2)	31,774	18,002	.57
Neodecanoyl chloride	1,862	(2)	(2)	(2)
Pivaloyl chloride	3,006	(2)	(2)	(2)
All other acids, acyl halides and anhydrides	4,381,681	1,009,502	651,579	.65
Salts of organic acids				
Total	681,472	420,494	261,913	.62
Acetic acid salts, total	57,028	21,736	16,734	.77
Sodium acetate	49,178	(2)	(2)	(2)
Zinc acetate	441	467	756	1.62
All other acetic acid salts	7,409	21,269	15,978	.75
Calcium neodecanoate	(2)	98	113	1.15
2-Ethylhexanoic acid (α-Ethylcaproic acid) salts, total	25,863	19,101	26,487	1.39
Cadmium 2-ethylhexanoate	859	(2)	(2)	(2)
Calcium 2-ethylhexanoate	2,789	2,843	2,483	.87
Cobalt 2-ethylhexanoate	5,280	4,159	8,111	1.95
Lead 2-ethylhexanoate	(2)	789	642	.81
Manganese 2-ethylhexanoate	1,144	1,111	1,037	.93
Zinc 2-ethylhexanoate	1,329	750	874	1.16
Zirconium 2-ethylhexanoate	4,651	3,091	5,205	1.68
All other 2-ethylhexanoic acid (α-ethylcaproic acid) salts	9,811	6,358	8,135	1.28
Lauric acid salts	2,533	(2)	(2)	(2)
Oleic acid salts	208	(2)	(2)	(2)
Potassium oxalate	31	33	96	2.89
Propionic acid salts, total	25,405	(2)	(2)	(2)
Calcium propionate	22,991	(2)	(2)	(2)
All other propionic acid salts	2,414	(2)	(2)	(2)

See footnotes at end of table.

Table 45—Continued
Miscellaneous cyclic and acyclic chemicals: U.S. production and sales, 1988

Miscellaneous cyclic and acyclic chemicals	*Production*	*Sales*		*Average Unit value*[1]
		Quantity	*Value*	
	1,000 pounds	*1,000 pounds*	*1,000 dollars*	*Per pound*
Acyclic—Continued				
Salts of organic acids—Continued				
Stearic acid salts, total[5]	156,819	152,930	105,393	$0.69
Aluminum stearates, total	4,785	4,730	5,871	1.24
Aluminum tristearate	1,687	1,672	2,420	1.45
All other aluminum stearates	3,098	3,058	3,451	2.71
Barium stearate	2,480	824	737	.89
Calcium stearate	87,943	94,209	53,321	.57
Magnesium stearate	21,116	15,815	12,538	.79
Zinc stearate	36,513	33,891	28,018	.83
All other stearic acid salts	3,982	3,461	4,908	1.42
All other salts of organic acids	413,585	226,596	113,090	.50
Aldehydes				
Total	9,270,472	2,136,235	284,281	.13
n-Butyraldehyde	1,775,674	59,853	11,724	.20
Formaldehyde (37% by weight)	6,280,452	1,691,683	144,046	.09
All other aldehydes	1,214,346	384,699	128,511	.33
Ketones				
Total	3,121,635	2,207,528	535,732	.25
Acetone	2,302,846	1,526,583	241,680	.16
Methyl ethyl ketone (2-Butanone)	482,028	424,337	166,628	.39
4-Methyl-2-pentanone (Methyl isobutyl ketone)	205,312	158,713	59,546	.38
All other ketones	131,449	97,895	67,878	.69
Alcohols, monohydric, unsubstituted				
Total	16,619,662	7,216,217	1,362,975	.19
Alcohols, C_{11} or lower, unmixed, total	15,182,611	6,660,714	1,040,390	.16
Butyl alcohols, total	3,256,875	760,208	188,280	.25
n-Butyl alcohol (n-Propylcarbinol)[4]	1,854,126	576,523	146,453	.25
Isobutyl alcohol (Isopropylcarbinol)[4]	155,459	107,691	29,525	.27
All other	1,247,290	75,994	12,302	.16
Ethyl alcohol, synthetic[4 6]	561,778	437,697	133,673	.31
2-Ethyl-1-hexanol	743,118	225,010	74,533	.33
Isopropyl alcohol[3]	1,388,882	1,111,119	200,799	.18
Methanol, synthetic[3]	8,142,388	3,690,341	267,879	.07
Propyl alcohol (Propanol)	215,669	124,218	43,469	.35
All other alcohols, monohydric, unsubstituted	873,901	312,121	131,757	.42
Alcohols, C_{12} and higher, unmixed, total	205,718	86,644	59,111	.68
Dodecyl (lauryl) alcohol	(2)	5,280	4,296	.81
1-Hexadecanol (cetyl alcohol)	(2)	16,653	12,397	.74
All other alcohols, C_{12} and higher, unmixed	(2)	64,711	42,418	.65
Mixtures of alcohols, total	1,231,333	468,859	263,474	.56
Containing C_{12} and higher	618,456	362,504	216,276	.60
Other mixtures of alcohols	612,877	106,355	47,198	.44

See footnotes at end of table.

Table 45—Continued

Miscellaneous cyclic and acyclic chemicals: U.S. production and sales, 1988

Miscellaneous cyclic and acyclic chemicals	Production	Sales		Average Unit value[1]
		Quantity	Value	
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Acyclic—Continued				
Esters of monohydric alcohols				
Total	6,164,622	2,780,949	1,278,258	$0.46
Allyl methacrylate	1,804	1,925	3,306	1.72
n-Butyl acetate	192,845	159,827	59,242	.37
Isobutyl acetate	83,419	55,436	17,850	.32
Butyl acrylate	551,536	223,048	118,503	.53
Di-2-ethylhexyl maleate	1,214	(2)	(2)	(2)
Dilauryl-3,3'-thiodipropionate	2,366	2,379	3,951	1.66
Distearyl-3,3'-thiodipropionate	2,939	2,946	4,936	1.68
2-Ethylhexyl acrylate	107,752	62,958	39,324	.62
2-Ethylhexyl chloroformate	5,830	(2)	(2)	(2)
Ethyl acetate (100% basis)	254,348	191,303	59,324	.31
Ethyl acrylate	344,244	157,947	73,061	.46
Fatty acid esters, not included with plasticizers or surface-active agents, total	13,579	10,282	7,035	.68
Myristyl myristate	(2)	115	228	1.97
Tridecyl stearate	1,702	836	579	.69
All other fatty acid ester not included with plasticizers or surface-active agents	11,877	9,331	6,228	.67
Isopropyl chloroformate	2,488	(2)	(2)	(2)
Isopropyl acetate	40,851	(2)	(2)	(2)
Lauryl methacrylate	(2)	1,409	2,218	1.57
Methyl methacrylate[4]	1,100,271	(2)	(2)	(2)
Phosphorus acid esters, not elsewhere specified	116,163	108,949	120,655	1.11
Triiso-octyl phosphite	415	(2)	(2)	(2)
Propyl acetate	70,833	62,118	29,018	.47
Vinyl acetate	2,561,434	1,184,162	439,094	.37
All other esters of monohydric alcohols	710,291	556,260	300,741	.54
Polyhydric alcohols[7]				
Total	7,621,796	5,781,334	2,027,166	.35
1,4-Butanediol	402,286	121,719	69,798	.35
Ethylene glycol[4]	5,517,250	4,406,675	1,442,933	.33
Pentaerythritol[4]	122,191	109,759	63,726	.58
Propylene glycol	840,460	742,899	211,715	.28
All other polyhydric alcohols	739,609	400,282	238,994	.60
Polyhydric alcohol esters, total	252,285	240,312	175,190	.73
Polyhydric alcohol ethers				
Total	2,093,801	1,762,551	819,822	.48
2-Butoxyethanol (Ethylene glycol monobutyl ether)	408,102	379,299	140,128	.38
2-(2-Butoxyethoxy)ethanol (Diethylene glycol mono-butyl ether)	73,427	61,232	30,713	.50
2-[2-(2-Butoxyethoxy)ethoxy]ethanol (Triethylene glycol monobutyl ether)	(2)	6,400	3,092	.48
Diethylene glycol	563,032	464,242	166,318	.36
Dipropylene glycol	78,129	68,107	21,561	.32

See footnotes at end of table.

Table 45—Continued

Miscellaneous cyclic and acyclic chemicals: U.S. production and sales, 1988

Miscellaneous cyclic and acyclic chemicals	Production	Sales		Average Unit value[1]
		Quantity	Value	
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Acyclic—Continued				
Polyhydric alcohol ethers—Continued				
2-(2-Ethoxyethoxy)ethanol (Diethylene glycol monoethyl ether)	(2)	22,352	10,854	$0.49
2-(2-Methoxyethoxy)ethanol (Diethylene glycol monomethyl ether)	36,756	(2)	(2)	(2)
2-[2-(2-Methoxyethoxy)ethoxy]ethanol (Triethylene glycol monomethyl ether)	35,027	(2)	(2)	(2)
Polyethylene glycol	119,623	111,234	69,204	.62
Polytetramethylene glycol ether	78,050	44,986	66,729	1.48
Triethylene glycol	135,955	160,462	58,962	.37
All other polyhydric alcohols ethers	565,700	444,237	252,261	.57
Brominated, chlorinated, and fluorinated hydrocarbons				
Total	28,340,031	10,567,719	2,743,112	.26
Brominated (including bromochlorinated) hydrocarbons, total	8,458	10,452	16,575	1.59
Chlorinated hydrocarbons, total	26,957,583	9,426,767	1,873,797	.20
Carbon tetrachloride[4]	761,365	849,267	129,427	.15
Chlorinated paraffins (C_{10}-C_{30}):				
35%-64% chlorine	79,167	79,017	27,644	.35
65% or more chlorine	(2)	21,033	8,730	.42
Chloroform[4]	523,637	541,540	99,139	.18
Chloromethane (Methyl chloride)[4]	597,077	208,687	40,360	.19
Dichloromethane (Methylene chloride)[4]	504,119	515,718	91,236	.18
Ethyl chloride (Chloroethane)[4]	151,846	103,476	14,261	.14
Ethylene dichloride (1,2-Dichloroethane)[4]	13,028,248	1,538,918	165,018	.11
Tetrachloroethylene (Perchloroethylene)	497,683	564,995	111,550	.20
1,1,1-Trichloroethane (Methyl chloroform)[4]	723,656	725,134	201,093	.28
Vinyl chloride, monomer (Chloroethylene)[4]	9,057,557	3,951,462	910,800	.23
All other chlorinated hydrocarbons	1,033,228	327,520	74,539	.23
Fluorinated (including other fluorohalogenated) hydrocarbons, total	1,373,990	1,130,500	852,740	.76
Chlorodifluoromethane (F22)	332,569	250,569	233,538	.93
Dichlorodifluoromethane (F12)	413,777	420,499	262,430	.62
Trichlorofluoromethane (F11)	249,012	253,119	116,688	.46
All other fluorinated (including other fluorohalogenated) hydrocarbons	378,632	206,313	240,084	1.17
All other miscellaneous acyclic chemicals				
Total	10,242,930	1,714,251	1,119,183	.65
Acyclic peroxides, total	101,159	53,647	80,451	1.50
tert-Butyl peroxypivalate	4,823	4,018	9,706	2.42
2-Butanone peroxide (MEK peroxide)	13,896	13,282	24,860	1.87
Di-tert-butyl peroxide	(2)	3,623	6,936	1.91
All other acyclic peroxides	82,440	32,724	38,949	1.19

See footnotes at end of table.

Table 45—Continued
Miscellaneous cyclic and acyclic chemicals: U.S. production and sales, 1988

Miscellaneous cyclic and acyclic chemicals	Production	Sales		Average Unit value[1]
		Quantity	Value	
	1,000 pounds	1,000 pounds	1,000 dollars	Per pound
Acyclic—Continued				
All other miscellaneous acyclic chemicals—Cont.				
Expoxides, ethers and acetals, total	8,240,377	1,276,700	485,851	$0.38
Ethylene oxide[4]	5,952,699	647,723	247,067	.38
Glycidyl ethers, total	7,106	8,383	14,124	1.68
1-Butoxy-2,3-epoxypropane (Butyl glycidyl ether)	813	956	1,523	1.59
All other glycidyl ethers	6,293	7,427	12,601	1.70
All other expoxides, ethers and acetals	2,280,572	620,594	224,660	.36
Fats and oils, chemically modified	34,114	32,526	16,284	.50
Organo-boron compounds	(2)	1,272	2,440	1.92
Organo-aluminum compounds	115,525	39,251	71,726	1.83
Chloropropyltrimethoxysilane	2,525	(2)	(2)	(2)
Silicone fluids	139,857	90,803	177,517	1.95
Organo-tin compounds	(2)	25,359	70,870	2.79
Phosgene (Carbonyl chloride)	949,177	(2)	(2)	(2)
All other miscellaneous acyclic chemicals	660,196	194,693	214,044	1.10
Mixtures not specifically itemized, total	141,031	136,924	23,150	.17
Fatty acid residues	24,015	(2)	(2)	(2)
All other mixtures not specifically itemized[8]	117,016	(2)	(2)	(2)

[1] Calculated from unrounded figures.
[2] Reported data are accepted in confidence and may not be published, or no data were reported.
[3] Statistics exclude production and sales of fatty amines. Statistics on fatty amines are included in the section "Surface-Active Agents."
[4] The difference between the production reported here and that shown on the *Preliminary Report on U.S. Production of Selected Organic Chemicals (Including Synthetic Plastics and Resin Materials), 1988*, results from a combination of incorrect reporting by some companies, end-of-year inventory adjustments, and rounding.
[5] Statistics exclude production and sales of potassium and sodium stearates. Statistics on these stearates are included in the section "Surface-Active Agents."
[6] Synthetic ethyl alcohol is conventionally defined as that portion made from ethylene. Bureau of Alcohol, Tobacco, and Firearms statistics give the production from "natural" sources, mainly grain.
[7] Some polyols which are used as intermediates for urethanes have been included in the section "Plastics and Resin Materials."
[8] Products included here are predominately acyclic; however, unspecified amounts of mixtures containing some cyclic chemicals may also be included.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 46

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous cyclic and acyclic chemicals	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 47)*
Cyclic		
6-Acetoxy-2,4-dimethyl-1,3-dioxane	No	GIV.
Alkylphenol formaldehyde condensate, alkoxylated	No	(2).
1-(2-Aminoethyl)piperazine	No	UCC.
1-(2-Aminoethyl)piperazine, technical	No	DOW, TRC.
1-(3-Aminopropyl)morpholine	No	TRC, TX.
Amyl ortho- and para- dimethylaminobenzoates	No	VND.
p-Amylphenol	No	SCN.
Anisaldehyde bisulfite	No	ASL.
Benzene 1,3-dihydroxy-2,4 nitroso	No	REM(E).
Benzenephosphinic acid	No	FER.
Benzene phosphonous dichloride	No	FER.
Benzoic acid esters:	Yes	
Benzoic acid, 2-butoxyethanol ester	No	PCI.
Benzoic acid, C_{12}-C_{15} ester	No	FTX.
Benzoic acid, isodecyl ester	No	VEL.
2-Butoxyethyl benzoate	No	(2).
Butyl benzoate	Yes	MRF, PCI, UTC.
2-Ethylhexyl benzoate	No	BRI.
Sucrose benzoate	No	VEL.
Benzoic acid salts:	Yes	
Ammonium benzoate	No	WTK.
Barium benzoate	No	FER, WTC.
Potassium benzoate	No	KLM, PFZ.
Sodium benzoate, U.S.P	No	KLM, PFZ.
Sodium benzoate, tech	No	HCP, JRC, PFZ.
Benzotriazole, polychlorinated	No	EK.
Benzotriazole, substituted	No	CGY.
Benzoyl peroxide	Yes	AZT, CAD, NOC, RCI, WTC, WTL.
Benzyl alcohol	No	KLM.
Benzyl chloroformate	No	VCM.
Bis[p-chlorobenzoyl]peroxide	No	CAD.
1,2-Bis(3,5-di-tert-butyl-4-hydroxyhydrocinnamoyl) hydrazine	No	ASL, CGY.
Bis(2,4-dichlorobenzoyl) peroxide	No	CAD.
Bis(a,a-dimethylbenzyl)peroxide	No	WTL.
2,2-Bis(ferrocenyl)propane	No	(2).
2,2-Bis(4-hydroxyphenyl)4-methylpentane	No	ASL.
Bis(perfluoroalkyl)bis(alpha-monochlorohydryl)-pyromellitate	No	HCL.
Bis(triphenylsilyl)chromate	No	(2).
Boron fluoride-phenol complex	No	ACS, WTC.
β-Bromo-β-nitrostyrene	No	GIV.
tert-Butylhydroquinone	No	EKT.
Butyl and isopropyl phthalimides	No	RPC.
2(and 3)-tert-Butyl-4-methoxyphenol (BHA)	No	EKT, UPM.
Butylmorpholine	No	TX.
tert-Butyl peroxybenzoate	No	AZT, FRE, NOC, WTL.
tert-Butylphenyl glycidyl ether	No	REZ, WLN.
Camphene	No	SCM.
Caprolactam (2-Oxohexamethylenimine)	Yes	ACS, BAS, CNP.
Caprolactam magnesium bromide	No	(2).
Cellulose acetate hexahydrophthalate	No	(2).
Cellulose acetate phthalate	No	EK.
1-(3-Chloroallyl)-3,5,7-triazo-1-azoniaadamatane chloride	No	DOW.
Chlorophenyl trichlorosilane	No	SCM.
Chlorothiaxanthone	No	PSG.
Cinnamonitrile	No	TNA.

See footnotes at end of table.

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous cyclic and acyclic chemicals	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 47)*
Cyclic—Continued		
Cresolsulfonic acid, formaldehyde condensate	No	HCL.
Cresyl glycidyl ether	No	REZ.
Cresyl glycidyl ether	No	TRC, WLN.
Cumene hydroperoxide	Yes	ART, BTL, FRE.
α-Cumyl peroxyneodecanoate	No	WTC, WTL.
Cyanuric acid	No	MON.
Cyclic silizane	No	SCM.
Cyclohexane carbonitrile	No	DUP.
Cyclohexane dimethanol diglycidyl ether	No	WLN.
Cyclohexanethiol	No	PAS.
2-Cyclohexene-1-octanoic acid, 5 (and 6)-carboxy-4-hexyl, $C_{21}H_{36}O_4$	No	WVA.
1,4-Cyclohexylenedimethanol	No	EKT.
Cyclohexyl methacrylate	No	CPS.
Decabromodiphenyl ether (DBDP)	No	DOW, GTL, TNA.
Decahydronaphthalene (Decalin)	No	DUP.
4,4-Diaminodiphenyl ether	No	MAL.
1,8-Diazabicyclo (5.4.0)undecane	No	AIP.
1,4-Diazobicyclo(2.2.2)octane	No	(2).
2,5-Di(benzoyl peroxy)-2,5-dimethylhexane	No	AZT, WTL.
Dibutoxy acetophenone	No	CWN.
Di-t-butyl diperoxyphthalate	No	WTL.
2,6-Di-tert-butyl-p-cresol (BHT):		
2,6-Di-tert-butyl-p-cresol, (BHT), food grade	No	USR.
2,6-Di-tert-butyl-p-cresol, (BHT), technical grade	No	UCC, USR.
2,5-Di-tert-butylhydroquinone	No	EKT.
1,1-Di(t-butyl peroxy) cyclohexane	No	WTL.
1,1-Di(t-butyl peroxy)-3,3,5-trimethyl cyclohexane	No	WTL.
2,4-Di-t-4-sec-butylphenol	No	SCN.
1,3-Dichloro-5,5-dimethylhydantoin	No	BRD.
Dicumyl peroxide	No	FRE.
1,1-Dicyclohexane	No	ALD.
Dicyclopentadienylchromium (Chromocene)	No	(2).
3-Diethylamino-6-methyl-7-(2,4-dimethylanilino) fluoran	No	ESA.
N,N'-Diethyl-N,N'-diphenylurea	No	VCM.
Di(2-ethylhexyl)chlorendate	No	VEL.
o,o-Diethyl-o-phenyl phosphorothioate	No	ICI.
1,5-Diethyl-2-thio-4,6-pyrimidinedione	No	TNI.
2,5-Dihydrothiophene-1,1-dioxide (Sulfolene)	No	PLC.
2,4-Dihydroxybenzophenone	No	BAS.
2,2'-Dihydroxy-4,4'-dimethoxybenzophenone	No	BAS.
Dihydroxydimethyl benzophenone	No	CWN.
3,5-Dihydroxy-3,5,dimethyl-1,2-peroxycyclopentane	No	WTL.
Diiodomethyl-p-tolyl sulphone	No	ABB.
Diisopropylbenzene hydroperoxide	No	HPC.
p-Dimethoxybenzene (Dimethyl ether of hydroquinone)	No	ASL.
N,N'-Dimethyl-N,N'-diphenylurea	No	VCM.
Dimethyl-2,6-naphthalene dicarboxylate	No	UTC.
4,4-Dimethyl oxazolidene	No	EFH.
Dimethyl piperazine	No	TX.
Dimorpholine diethyl ether	No	TX.
Di-tert-octyl hydroquinone	No	EKT.
Dioxane (1,4-Diethylene oxide)	No	FER.
1,3-Dioxolane	No	FER.
Di-para-xylene	No	WCC.
1,2-Diphenoxyethane	No	ASL.
Diphenyl-t-butylhexyl phosphite	No	WTC.
Diphenylisodecyl phosphite	No	WTC.
Diphenylisooctyl phosphite	No	WTC.
Dipropylene glycol salicylate	No	SBC.

See footnotes at end of table.

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous cyclic and acyclic chemicals	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 47)*
Cyclic—Continued		
4-(Dodecyloxy)-2-hydroxybenzophenone	No	EKT.
Dodecyl pyridinium chloride	No	TLC.
6-Ethoxy-12-dihydro-2,2,4-trimethyl quinoline	No	MNA, MON.
Ethyl-2-cyano-3,3-diphenyl acrylate	No	BAS.
Ethyl cyclohexylamine	No	AIP.
2,Ethylhexyl-2-cyano-3,3-diphenyl acrylate	No	BAS.
2-Ethylhexyl-1-p-dimethylaminobenzoate	No	CWN, VND.
2-Ethylhexyl-p-methoxy cinnamate	No	VND.
Ethylidine norbornene	No	UCC.
4-Ethylmorpholine	No	TX.
N-Ethyl pyrrolidone	No	GAF.
Furan derivatives:		
α-Ethyl furfuryl alcohol	No	TNA.
2-Furaldehyde (Furfural)	No	QKO.
Furoic acid	No	QKO.
Methyl furan	No	QKO.
Methyl tetrahydrofuran (Methyl THF)	No	QKO.
Tetrahydrofurfuryl alcohol	No	QKO.
All other furan derivatives	No	BRD, QKO, TCH.
Glyceryl p-aminobenzoate	No	VND.
Hexabromocyclodecane	No	TNA.
Hexamethylenetetramine, tech	Yes	BOR, HMP, PLS, WCL.
Homomenthyl salicylate	No	WTC.
Hydrindantin	No	PIC.
Hydroquinone, di(β-hydroxyethyl) ether	No	EKT.
p-Hydroxybenzoic acid, butyl ester	No	KLM.
p-Hydroxybenzoic acid, ethyl ester	No	KLM.
p-Hydroxybenzoic acid, methyl ester	No	KLM, LEM.
p-Hydroxybenzoic acid, propyl ester	No	KLM, LEM.
N-(Hydroxyethyl)piperazine	No	TCH, UCC.
2-Hydroxy-4-methoxybenzophenone	No	BRD, VND.
2,Hydroxy-4-methoxybenzophenone-5-sulfonic acid	No	BAS.
Hydroxymethyl-5,5-hydantoin	No	BRD.
2-Hydroxy-4-N-octoxybenzophenone	No	BAS.
a-D-p-Hydroxyphenylglycine methyl ester K	No	BOC.
1,2,3-Indantrione monohydrate (Ninhydrin)	No	PIC.
Isobutyl biphenyl	No	TCC.
Lactones:	Yes	
Butyrolactone	No	BAS, GAF.
Caprolactone	No	UCC.
Diketene	No	EKT.
Lanolin acid	No	UCC.
Lanolin alcohol acetate	No	UCC.
Lanolin, hydroxylated	No	UCC.
Lanolin oil	No	UCC.
Lanolin wax	No	UCC.
Maleic anhydride	Yes	AMO, ART, ASH, DKA, MON.
Methoxyethyl morpholine	No	TX.
4-Methoxyphenol	No	ASL, EKT.
p-Methoxytoluene	No	ASL.
Methylaziridine	No	ARS.
Methylbenzene sulfonate	No	EK.
Methyl-p-benzoquinone	No	EK.
2-Methylcyclohexylamine	No	AIP.
3-(N-Methyl-N-cyclohexylamino)-6-methyl-7-anilino fluora	No	GTL.

See footnotes at end of table.

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous cyclic and acyclic chemicals	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 47)*
Cyclic—Continued		
Methyl-3,5-di-tert-butyl-y-hydroxyhydrocinnamate	No	CGY.
4-Methylmorpholine	No	TX.
4-Methylphthalic anhydride	No	ICI.
1-Methyl-2-pyrrolidone, monomer	No	BAS, GAF.
Methyltetrahydrophthalic anhydride	No	DIX(E).
Morpholine	Yes	AIP, BAS, DOW, TX.
Morpholine salt of p-toluene sulfonic acid	No	AMB.
1,2-Naphthoquinone-2-diazide-5-sulfonyl chloride (215-sulfonyl chloride)	No	ASL.
N-Nitrosophenylhydroxylamine salt	No	MAL.
Nonylphenol, alkoxylated/aminated	No	TX.
Nonylphenol glycidyl ether	No	WLN.
Octabromodiphenyl oxide	No	TNA.
Octadecyl-3-(3,5-di-tert-butyl-4-hydroxyphenyl)-propionate	No	CGY, TNA.
Octylmethoxy cinnamate	No	TMH.
Oxalyl bis(benzylidene hydrazide)	No	EKT.
Phenethyl bromide	No	WCC.
Phenol glycidyl ether	No	TRC.
Phenol-sulfonated formaldehyde rosin	No	HCL.
2-Phenoxyethanol (Ethylene glycol monophenyl ether)	No	TCH, UCC.
Phenyl acid phosphate	No	ALW.
Phenyldiisodecyl phosphite	No	WTC.
Phenyl glycidyl ether	No	REZ, WLN.
a-D-Phenylglycine methyl ester K.	No	BOC.
1-Phenyl-2-hydroxy-2-methyl-propanone-1	No	CWN.
N-Phenyl-1-naphthylamine	No	UCC.
Phenylpropanolamine	No	ORT.
Phenyl xylyl ethane	No	HCC, TCC.
Phosphonate ester, cyclic	No	ALW.
Phthalic acid, lead salt, (Dibasic)	No	ALI.
Picramic acid, sodium salt	No	SDC.
Pinene and derivatives:	Yes	
Pinane	No	NCI, SCM.
Pinane hydroperoxide	No	SCM.
2-Pinanol (cis and trans)	No	SCM.
α-Pinene	No	ARZ, SCM.
β-Pinene	Yes	ARZ, NCI, SCM.
α-Pinene epoxide	No	SCM.
α-Pine, sulfate	No	VIK.
Pinene, sulfate	No	ARZ, HPC, NCI.
Pinene, wood	No	HPC.
Pine oil, natural, sulfate	Yes	ARZ, NCI, SCM.
Pine oil, synthetic	No	ARZ, SCM.
Poly-4-(2-acryloxyethoxy)-2-hydroxybenzophenone	No	(2).
Polyglycols-toluene diisocyanate reaction product	No	(2).
Propylene glycol dibenzoate	No	VEL.
Propyl gallate	No	EKT.
2,4(1H,3H)Pyrimidinedione	No	SCM.
2-Pyrrolidone-1-ethyl polymer with 1-eicosene	No	GAF.
p-Quinone	No	EKT.
Resorcinol diglycidyl ether	No	WLN.
Resorcinol monobenzoate	No	EKT.
Rosin acid salts:		
All other rosin acid salts	No	GP.
Salicylic acid, ammonium salt	No	WTK.
Salicylic acid magnesium salt	No	KLM, WTK.
Stannous octyl phthallate	No	(2).

See footnotes at end of table.

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous cyclic and acyclic chemicals	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 47)*
Cyclic—Continued		
Styphnic acid, lead salt	No	REM.
Styphnic acid, magnesium salt	No	REM(E).
Styrene oxide	No	UCC.
Succinic anhydride	No	BCC, MIL.
Succinic anhydride derivatives:	Yes	
Dodecenylsuccinic anhydride	No	BCC, DIX(E), HMY.
Dodecylsuccinic anhydride	No	MIL.
Iso-Hexadecenyl succinic anhydride	No	DIX(E), HMY.
Iso-octadecenylsuccinic anhydride	No	DIX(E), HMY.
Nonenylsuccinic anhydride	No	HMY.
Octadecenyl succinic anhydride	No	HMY.
Octenylsuccinic anhydride	No	HMY, MIL.
All other succinic anhydride derivatives	No	HMY.
Sulfosalicylic acid	No	SHX.
Tall oil acyl chloride	No	CCC.
Tall oil, chemically modified	No	FOC, WVA, (2), (2).
Tall oil fatty acids, polymerized	No	WVA.
Tall oil monomer	No	WTC.
Tall oil pentaerythritol tallate	No	EFH.
Tall oil salts (Linoleic-rosin acid salts):	Yes	
Calcium manganese tallate	No	MCI, SHP.
Cobalt manganese tallate	No	MCI, SHP.
Cobalt tallate	No	MCI, SHP, (2).
Lead tallate	No	MCI.
Manganese tallate	No	MCI, SHP.
Zinc tallate	No	MCI.
All other tall oil salts, (Linoleic-rosin acid salts)	No	CCA, CIN, GAF, (2).
Tannic acid, N.F	No	MAL.
Terpene hydrocarbons, monocyclic (Solvenol)	No	HPC, NCI, SCM.
Tetrabromobisphenol A	No	GTL, TNA, (2).
1,2,3,4-Tetrahydronaphthalene (Tetralin)	No	DUP.
Tetrahydrothiophene	No	PAS.
Tetrahydrothiophene-1,1-dioxide (Sulfolane)	No	PLC.
Tetrakis[methylene(3,5-di-tert-butyl-4-hydroxyhydrocinnamate)methane]	No	CGY.
Thiodiethylene bis(3,5-di-tert-butyl-4-hydroxyhydrocinnamate	No	CGY.
Thiophene	No	PAS.
1,3,5-Triazine-(1,3,5(2H,4H,6H))-triethanol	No	(2).
3,4,4'-Trichlorocarbanilide	No	MON.
Trichloromelamine	No	DOW, GFS.
1,3,5-Trichloro-s-triazine-2,4,6-(1H,3H,5H)trione (Trichloroisocyanuric acid)	No	MON, OMC.
Tri(2,4-ditertiarybutylphenyl) phosphite	No	WTC.
Tri(methoxymethyl) tri(stearoxymethyl) melamine	No	WPG.
Trimethyl-1-cyclohexane	No	ENJ.
3,3,5-Trimethylcyclohexanol (m-Homomenthol)	No	ARS.
3,5,5-Trimethyl-2-cyclohexene-1-one (Isophorone)	No	UCC.
2,4,6-Trinitroresorcinol and lead derivative	No	REM.
Triphenyl phosphite	No	WTC.
Triphenyltin hydroxide	No	(2).
Tris(3,5-di-tert-butyl-y-hydroxybenzyl)isocyanurate	No	CGY.
1-Vinyl-2-pyrrolidinone—other copolymers	No	GAF.
1-Vinyl-2-pyrrolidinone-methylacrylic acid, dimethylamine ethyl ester, copolymer	No	GAF.
1-Vinyl-2-pyrrolidinone, monomer	No	GAF.
1-Vinyl-2-pyrrolidinone—vinyl acetate copolymer	No	GAF.

See footnotes at end of table.

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous cyclic and acyclic chemicals	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 47)*
Cyclic—Continued		
All other cyclic chemicals	No	AAC, ALW, ASL, BAS, COC, CWN, EK, EKT, HCL, HK, MIL, PAC, PAH, PIC, REG, REM, REZ, RH, RSA, S, SCM, SHP, TNA, TRC, UCC, WLN, WTC, WTL, (2), (2).
Acyclic		
Nitrogenous compounds:	Yes	
Acetaldehyde dimethylhydrazone	No	DIX(E).
Adipic acid-diethylene triamine condensate	No	EFH.
Amides:	Yes	
Acetamide	No	WTK.
Acrylamide monomer	No	ACY, BFG, COS.
Amidoamines	No	PAC.
Amido amine salts as curing agents	No	(2).
1,1'-Azobisformamide	No	FMT, USR.
Behenamide	No	WTC.
Bis[2-(octadecylamido)ethyl]-N-(2-cyanoethyl)-N-ethyl ammonium ethyl sulfate	No	SBC.
Chloromethylene dimethyliminium (Amide chloride)	No	CWN.
Coconut oil amide	No	CAD, FER.
2-Cyanoacetamide	No	TLI.
N,N-Diethyldodecanamide	No	EK.
N,N-Dimethylacetamide	No	DUP, MON.
N,N-Dimethylacetoacetamide	No	BRD, EKT.
Dimethylaminopropyl methacrylamide	No	TX.
N,N-Dimethylformamide	No	AIP, DUP, SYP.
Dimethyl oleamide	No	HAL.
Erucamide	No	ARC, WTC.
Erucyl stearamide	No	WTC.
N,N'-Ethylenebis-oleamide (Oleic acid-ethylenediamine condensate (Amine/acid ratio = 1/2))	Yes	BRD, CCW, WTC.
N,N'-Ethylenebis(stearamide)	Yes	BRD, CCW, WTC.
Fatty acid amide mixtures	No	GAF.
N-(Hydroxymethyl)-formamide	No	(2).
Methacrylamide	No	BFG, DUP.
Monomethylacetoacetamide	No	EKT.
Oleamide (Octadecene amide)	Yes	ARC, SYP, WTC.
Oleoylpalmitamide	No	HXL, WTC.
Oxamide	No	HML, (2).
Stearamide (Octadecane amide)	No	SYP, WTC.
Stearylerucamide	No	HXL, WTC.
Stearyl stearamide	No	WTC.
Tallow amide, hydrogenated	No	ARC, CAD.
All other amides	No	ARC, ARS, EK, HAL, PAH, REG, WTC.
Amines:	Yes	
t-Alkylamines, primary, mixed	No	RH.
Allylamines:		
Allylamines	No	HCL.
Diallylamine	No	HCL.
Triallylamine	No	HCL.
Bis-hexamethylenetriamine amine	No	DUP, MON.
Butylamines:	Yes	
n-Butylamine, mono	No	AIP, PAS.
sec-Butylamine, mono	No	FER, PAS.
tert-Butylamine, mono	No	MON, SC.
Di-n-Butylamine	No	AIP, PAS.
Diisobutylamine	No	AIP, HCL.

See footnotes at end of table.

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous cyclic and acyclic chemicals	Separate statistics[1]	Manufacturers' identification codes (according to list in table 47)
Acyclic—Continued		
Nitrogenous compounds—Continued		
Amines—Continued		
Butylamines—Continued		
Tri-n-butylamine	No	AIP, PAS.
n-Butylethylamine	No	AIP.
Carbamate 82M	No	AIP.
Di-tert-butylethyldiamine	No	HCL.
Diethylenetriamine	No	DOW, TX, UCC.
Diisopropylamine	No	AIP, PAS, UCC.
Dimethylaminopropylamine	No	AIP, BAS, TX.
N,N-Dimethylbutylamine	No	HCL.
Ethylamines:		
Diethylamine	No	AIP, HCL, PAS, UCC.
Ethylamine, mono-	No	AIP, HCL, PAS, PLC, UCC.
Triethylamine	No	AIP, PAS, UCC.
Ethylenediamine	Yes	DOW, TX, UCC.
2-Ethylhexylamine, mono-	No	PAS.
N-Ethyl-2-methylallylamine	No	HCL.
Fatty amines	No	NCI.
1,6-Hexanediamine (Hexamethylenediamine)	No	DUP, MON.
n-Hexylamine	No	CXI, PAS.
Isopropylamines:		
Isopropylamine, mono	Yes	AIP, HCL, PAS, UCC.
Methylamines:		
Dimethylamine	Yes	AIP, DUP, GAF, IMC, UCC, (2).
Methylamine, mono-	No	AIP, DUP, GAF, IMC.
Trimethyl amine	Yes	AIP, DUP, GAF, IMC.
tert-Octylamine	No	RH.
Pentaethylenehexamine	No	DOW, UCC.
Pentylamines (Amylamines):		
Dipentylamine	No	HCL, PAS.
Pentylamine, mono-	No	PAS.
Tripentylamine	No	PAS.
Poly(oxypropylene)diamine	No	TX.
Propylamines:		
Dipropylamine	No	AIP, HCL, PAS.
Propylamine, mono-	No	AIP, PAS.
Tripropylamine	No	AIP, PAS.
Tetraethylenepentamine	No	DOW, UCC.
N,N,N',N'-Tetramethyl-1,3-butanediamine	No	MON, UCC.
Tetramethylethylenediamine	No	BKM.
Triethylenediamine	No	TX.
Triethylenetetramine	No	DOW, TRC, UCC.
All other amines	No	ARC, EK, MON, PAC, REG, TRC, UCC, (2).
Other amine-function chemicals:		
Alkyl C_{12}-C_{14} amine hydrochloride	No	COS.
2-Aminoethanol hydrochloride	No	OMC, (2).
2-Aminoethanol (Monoethanol amine) sulfite	No	EVN.
Aminoethoxyethanol	No	TX.
2-(2-Aminoethylamino)ethanol (Aminoethylethanolamine)	No	DOW, UCC.
(2-Aminoethyl)amino]ethanol, reaction product with octadecanoic acid	No	BRI.
2-Aminoethyl mercaptoacetate (Monoethanolamine thioglycolate)	No	EVN.
2-Amino-2-ethyl-1,3-propanediol	No	ANG.
Aminoguanidine hydrochloride	No	REM(E).

See footnotes at end of table.

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous cyclic and acyclic chemicals	Separate statistics[1]	Manufacturers' identification codes (according to list in table 47)
Acyclic—Continued		
Nitrogenous compounds—Continued		
Amines—Continued		
Other amine-function chemicals—Continued		
2-Amino-2-(hydroxymethyl)-1,3-propanediol [Tris(hydroxymethyl)aminomethane]	No	ANG, WTK.
2-Amino-2-methyl-1,3-propanediol	No	ANG.
2-Amino-2-methyl-1-propanol	No	ANG.
Bis(dimethylaminoethyl) ether	No	TX.
tert-Butylaminoethyl methacrylate	No	AAC, CPS.
tert-Butyldiethanolamine	No	PAS, UCC.
tert-Butyl ethanolamine	No	UCC.
tert-Butyl urea	No	ADC, PAS.
2-Chloro-N,N-dimethylethylamine (Dimethylamino ethyl chloride) hydrochloride	No	SOM.
Choline	No	RH.
Diallyldimethyl ammonium chloride	No	CPS, (2).
Di-amine derivatives of dimer acids	No	TRC, WTC.
2-Dibutylaminoethanol	No	PAS.
Dibutylaminomethanol	No	(2).
2-Diethylaminoethanol (N,N-Diethylethanolamine)	No	PAS, UCC.
2-(2-Diethylaminoethoxy)ethanol	No	PAS, UCC.
2-Diethylaminoethyl acrylate	No	CPS.
Diethylaminoethylacrylate, dimethyl sulfate, quaternary salt	No	CPS.
2-Diethylaminoethyl methacrylate	No	CPS, DUP.
Diethylcarbamoyl chloride	No	GAF.
Diethylglycol amine (DEGA)	No	AIP.
Diethylhydroxylamine	No	PAS.
1,3-Diethyl-2-thiourea	No	PAS.
2-Diisopropylaminoethanol (N,N-Diisopropylethanolamine)	No	PAS, UCC.
2-Diisopropylaminoethyl methacrylate	No	DUP.
Dimethylamine epichlorohydrin copolymer	No	CPS.
2-Dimethylaminoethanethiol hydrochloride	No	EVN.
2-Dimethylaminoethanol (N,N-Dimethylethanolamine)	Yes	AIP, PAS, PEL, TX, UCC.
Dimethylaminoethyl acrylate,dimethyl sulfate, quaternary salt	No	CPS.
Dimethylaminoethylacrylate, methyl chloride, quaternary salt	No	CPS.
Dimethylaminoethyl methacrylate	No	AAC, CPS.
Dimethylaminoethylmethacrylate, dimethyl sulfate, quaternary salt	No	AAC, CPS.
Dimethylaminoethylmethacrylate, methyl chloride, quaternary salt	No	AAC, CPS.
Dimethylaminomethanol	No	(2).
2-Dimethylamino-2-methyl-1-propanol hydrochloride	No	WPG.
1-(Dimethylamino)-2-propanol	No	PAS, PEL.
Dimethylaminopropylamine,propoxylated	No	TX.
2,5-Dithiobiurea	No	GAF.
Ethanolamines:	Yes	
Diethanolamine	Yes	CNE, DOW, OMC, TX, UCC.
Monoethanolamine	Yes	CNE, DOW, OMC, TX, UCC.
Triethanolamine	Yes	CNE, DOW, OMC, TX, UCC.
2-Ethylaminoethanol (Ethylmonoethanolamine)	No	PAS.
1,1-Ethylenediurea	No	EK.
5-(N-Ethyl-N-hydroxyethylamino)-2-pentanone	No	SDW.
2-Ethyl-2-nitro-1,3-propanediol	No	SDW.
Fatty acid, alkanolamine ester	No	(2).

See footnotes at end of table.

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous cyclic and acyclic chemicals	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 47)*
Acyclic—Continued		
Nitrogenous compounds—Continued		
Amines—Continued		
Other amine-function chemicals—Continued		
Guanidine hydrochloride	No	EK.
Hexamethylenediamine adipate (Nylon salt)	No	DUP, MON, (2).
Hexamethylene-1,6-diisocyanate (HDI)	No	MOB.
Hexamethylene-a,6-diisocyanate,biurets (HDI-biurets)	No	MOB.
Hexamethylene-1,6-diisocyanate trimers (HDI trimers)	No	MOB.
Hexylamine ethoxylate	No	CXI.
N-(2-Hydroxyethyl)-12-hydroxystearamide	No	CAS.
2-(Hydroxymethyl)-2-nitro-1,3-propanediol (Tris-(hydroxymethyl)nitromethane)	No	ANG.
Iminodiacetic acid	No	HMP, (2).
Isopropanolamines:		
Diisopropanolamine	No	DOW.
Dimethyl isopropanolamine	No	PEL.
Monoisopropanolamine	No	DOW.
Triisopropanolamine	No	DOW.
2-Isopropylaminoethanol	No	PAS, UCC.
Ketimine, tetrafunctional	No	PAC.
3-Methoxypropylamine	No	BAS, TX.
2-Methylaminoethanol (N-Methylethanolamine)	No	PAS, UCC.
Methyl hydrazine, mono	No	OMC, UCC.
2,2'-(Methylimino)diethanol (Methyldiethanolamine)	No	DOW, PAS, TX.
2-Methyl-2-nitro-1-propanol	No	ANG.
Mixed higher glycol amine (MHGA)	No	AIP.
Nitrated lard oil	No	SM.
Nitriles:	Yes	
Acetonitrile	Yes	BKC, DUP, SOH, (2).
Acrylonitrile, monomer	Yes	AAC, ACY, BFG, DUP, MON, SC, SOH.
Adiponitrile	No	DUP, MON.
Aminodimethyl butyronitrile	No	NOD.
2,2-Azobis(dimethyl pentane nitrile)	No	DUP.
2,2-Azobis(2-methyl butane nitrile)	No	DUP.
2,2'-Azobis[2-methylpropionitrile] (Azobisisobutyronitrile)	No	DUP.
n-Butyronitrile	No	EKX.
Cyanoacetic acid (Malonic nitrile)	No	NOD.
1-(2-Cyanoethyl)ethyl urea	No	GAF.
3-Ethoxypropionitrile	No	DIX.
Ethyl cyanoacetate	No	NOD.
Isobutyronitrile	No	EKX.
3-Methoxypropionitrile	No	(2).
Methyl cyanoacetate	No	NOD.
4-Methyl-5-hydroxymethyl imidazole	No	SK.
2-Methyllactonitrile (Acetone cyanohydrin)	Yes	CYR, DUP, RH, SOH.
Propionitrile	No	MON.
Stearonitrile (Octadecane nitrile)	No	SHX.
Tallow nitrile	No	SHX.
3,3'-Thiodipropionitrile	No	EVN.
Trichloroacetonitrile	No	OMC.
All other nitriles	No	COC, EK, EKT, HXL.
Nitroethane	No	ANG, GON.
Nitromethane	No	ANG, GON.
1-Nitropropane	No	ANG, GON.
2-Nitropropane	No	ANG, GON.
N-n-Octyl glucamine	No	(2).
Semicarbazide hydrochloride	No	OMC.

See footnotes at end of table.

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous cyclic and acyclic chemicals	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 47)*
Acyclic—Continued		
Nitrogenous compounds—Continued		
Stearylamidopropyl dimethylamine lactate	No	WM.
Tetraethyl ammonium bromide	No	RSA.
Thiosemicarbazide	No	FMT.
Triethylenetetramine, propoxylated	No	HXL.
Trimethylamine hydrochloride	No	RSA, (2).
All other nitrogenous compounds, acyclic	No	ADC, ARC, ASL, HCL, OMC, REG, RSA, TX, UCC, (2), (2), (2).
Acids, acid anhydrides, and acyl halides:		
Acetic acid, synthetic (100%)	Yes	AIP, BCP, EKT, HCL, MON, SC, UCC, USI.
Acetic anhydride, 100%:		
Acetic anhydride from acetic acid, other than recovered, by the vapor-phase process (100%)	No	EKT, UCC.
Acetic anhydride from acetic acid, recovered, by vapor-phase process	No	PFZ.
Acetyl chloride	No	WCC.
Acrylic acid	Yes	BAS, HCL, RH, UCC.
Adipic acid	No	BFG, DUP, MON.
Anhydride-acid mixture	No	HCL.
2,2-Bis(Hydroxy-methyl)-propionic acid	No	IMC.
Bromoacetic acid	No	WCC.
Bromobutyric acid	No	EKT, GTL.
2-Bromohexanoic acid	No	EKT.
Butyric acid	No	EKT, HCL.
Butyric anhydride	No	EKT.
Butyryl chloride	No	WCC.
Castor oil fatty acids, dehydrated	No	CAS.
Chloroacetic acid, mono	No	PFZ.
Citric acid	No	MLS, PFZ.
Cocoyl chloride	No	WCC.
Crotonic acid (2-Butenoic acid)	No	EKT.
Decanoyl chloride	No	WTL.
2,2-Dichloroacetyl chloride	No	RDA.
Dimer acid (C_{36} Aliphatic dibasic acid)	No	SYL, WTC.
Dithiodiglycolic acid	No	EVN.
Dithiodipropionic acid	No	EVN.
Dodecanedioic acid	No	DUP.
2-Ethylhexanoic acid (α-Ethylcaproic acid)	No	EKT, UCC.
2-Ethylhexanoyl chloride	Yes	PPG, WTC, WTL.
Fatty acids, hydrogenated	Yes	ARC, BRD, DRL, SHX, SYP, WTC.
Fatty acids, mixed chain length, synthetic	No	SYP.
Fatty acids, non-hydrogenated	Yes	ARC, BRD, CAS, DRL, WTC.
Fatty acids, partially hydrogenated	No	WTC.
Fumaric acid	Yes	DKA, MON, PFZ.
Gluconic acid, technical	No	PFZ, PMP.
Glutaric acid	No	EK.
Glycolic acid (Hydroxyacetic acid)	No	DUP.
Heptanoic acid	No	ENJ, HCL.
Isoascorbic acid (Erythorbic acid)	No	PFZ.
Isobutyric acid	No	EKX.
Isobutyric anhydride	No	EKT, FER.
Isononanoyl chloride	No	HCL.
Iso-octadecenoic acid	No	SYL.
Itaconic acid (Methylenesuccinic acid)	No	PFZ.
Lactic acid	No	SC.
Lauroyl chloride	No	WTL.

See footnotes at end of table.

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous cyclic and acyclic chemicals	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 47)*
Acyclic—Continued		
Acids, acid anhydrides, and acyl halides—Continued		
Malic acid	No	DKA.
Mercaptoacetic acid (Thioglycolic acid)	No	ELC, EVN.
3-Mercaptopropionic acid	No	EVN, WTC.
Mercaptosuccinic acid (Thiomalic acid)	No	EVN.
Methacrylic acid	No	DUP, RH.
Methanesulfonic acid	No	PAS.
Methanesulfonyl chloride	No	PAS.
Neo-C_9-C_{12} acids	No	ENJ.
Neodecanoic acid	No	ENJ.
Neodecanoyl chloride	Yes	PPG, WTC, WTL
Neoheptanoyl chloride	No	WTC.
Nonanoic acid (Pelargonic acid)	No	EMR, HCL.
Nonanoyl chloride	No	WCC.
Octanoyl chloride	No	WCC, WTL.
Oleic acid	No	DRL, WTC.
Oxidized Fischer-Tropsch wax	No	ENJ, SQA.
Palmitoyl chloride	No	HCL.
Pivaloyl chloride	Yes	PPG, WCC, WTC, WTL.
Polyacrylic acid	No	BFG, BKM, RH.
Polyisopropenylphosphinic acid	No	NES.
Propionic acid	No	EKT, HCL, UCC.
Propionic anhydride	No	EKT.
Propionyl chloride	No	WCC.
Sebacic acid	No	WTH.
Sebacoyl chloride	No	ALD, EK.
3,3'-Thiodipropionic acid	No	EVN.
Thiodisuccinic acid	No	EVN.
Thiolactic acid	No	EVN.
Trichloroacetic acid	No	MNA.
Trifluoroacetic acid	No	HOC.
Trifluoroacetic anhydride	No	HOC.
Trifluoroacetyl chloride	No	HOC.
Trimer dibasic acids	No	WTC.
Valeric acid	No	UCC.
Valeroyl chloride	No	WCC.
All other acids, acid anhydrides, and acyl halides	No	ARC, COC, DUP, EK, ENJ, HMY, HOC, PAH, PG, UCC.
Salts of organic acids:		
Acetic acid salts:	Yes	
Aluminum acetate	No	HCP, JRC, NCC.
Ammonium acetate	No	BKC, WTK.
Barium acetate	No	BKC.
Calcium acetate	No	HFT, NCC.
Chromium acetate	No	SHP.
Cobalt acetate	No	SHP.
Cobalt manganese acetate	No	SHP.
Copper acetate	No	BKC.
Hydrazine acetate	No	FMT.
Lead acetate	No	BKC.
Lead subacetate	No	BKC.
Magnesium acetate	No	BKC, SHP.
Manganese acetate	No	SHP.
Nickel acetate	No	SHP.
Potassium acetate	No	BKC, HCP, JRC, NCC, PEL.
Sodium acetate	Yes	ATL, BKC, BRI, DAN, HCP, JRC, MAL, NCC, UCC, (2).
Sodium diacetate	No	HCP, JRC, NCC.

See footnotes at end of table.

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous cyclic and acyclic chemicals	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 47)*
Acyclic—Continued		
Salts of organic acids—Continued		
Acetic acid salts—Continued		
Zinc acetate	Yes	BKC, CCC, DIX, SHP, WTK.
Zirconium acetate	No	CCC, TZC.
Adipic acid, ammonium salt	No	ACS.
Adipic acid, sodium salt	No	QCP.
Adipic dihydrazide	No	FMT.
3-Allyloxy-2-hydroxypropane sulfonic acid, sodium salt	No	([2]).
1,2,4-Butanetricarboxylic acid, 2-phosphono, sodium salt	No	BRI.
Citric acid salts:		
Ammonium citrate	No	PFZ.
Calcium citrate	No	PFZ.
Potassium citrate	No	HXL, MLS, PFZ.
Sodium citrate	No	BRI, CIN, HXL, MLS, PCI, PFZ, ([2]).
Zinc citrate	No	WTK.
All other citric acid salts	No	([2]).
Diammonium dithiodiglycolate	No	EVN.
2-Ethylhexanoic acid (alpha-ethylcaproic acid) salts:	Yes	
Aluminum 2-ethylhexanoate	No	NOC.
Barium 2-ethylhexanoate	No	NOD, WTC.
Bismuth 2-ethylhexanoate	No	SHP.
Cadmium 2-ethylhexanoate	Yes	CCA, FER, WTC.
Calcium 2-ethylhexanoate	Yes	CCA, FER, MCI, NOD, TRO, WTC.
Cerium 2-ethylhexanoate	No	SHP.
Chromium 2-ethylhexanoate	No	MCI, SHP.
Cobalt 2-ethylhexanoate	Yes	CCA, MCI, NOD, SHP, TRO.
Cobalt-potassium 2-ethylhexanoate	No	MCI.
Copper 2-ethylhexanoate	No	MCI, NOD.
Iron 2-ethylhexanoate	No	CCA, NOD.
Lead 2-ethylhexanoate	No	CCA, NOD, SHP, TRO.
Manganese 2-ethylhexanoate	Yes	CCA, MCI, NOD, SHP, TRO.
Nickel 2-ethylhexanoate	No	MCI, SHP.
Potassium 2-ethylhexanoate	No	CCA, MCI, PEL.
Rare earths 2-ethylhexanoate	No	CCA, MCI.
Sodium 2-ethylhexanoate	No	LIL.
Stannous 2-ethylhexanoate	No	FER.
Zinc 2-ethylhexanoate	Yes	CCA, FER, MCI, NOD, OMC, SHP, TRO, VNC, WTC.
Zirconium 2-ethylhexanoate	Yes	CCA, MCI, NOD, TRO.
All other 2-ethylhexanoic acid salts	No	NOD, SHP.
Fish oil, C_{14}-C_{22} menhaden, lead salts	No	ELC.
Formic acid salts:		
Ammonium formate	No	RSA, WTK.
Calcium formate	No	IMC.
Potassium formate	No	HCP, JRC.
Sodium formate, technical	No	BKC, PST.
Fumaric acid, lead salt	No	ALI.
Gluconic acid salts:		
Sodium gluconate	No	PFZ, PMP.
Glycolic acid, potassium salt	No	HCP, JRC.
Glycolic acid, sodium salt	No	BRI, HCP, JRC.
Isoascorbic acid, sodium salt (Sodium erythorbate)	No	PFZ.
Tertiary-alpha-alkylcarboxylic acid salts (isocarboxylic acid salts):		
Calcium t-α-alkylcarboxylate	No	MCI.
Cobalt t-α-alkylcarboxylate	No	MCI.

See footnotes at end of table.

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous cyclic and acyclic chemicals	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 47)*
Acyclic—Continued		
Salts of organic acids—Continued		
Tertiary-alpha-alkylcarboxylic acid salts (isocarboxylic acid salts)—Continued		
Copper t-α-alkylcarboxylate	No	MCI.
Iron t-α-alkylcarboxylate	No	MCI.
Lead t-α-alkylcarboxylate	No	MCI.
Manganese t-α-alkylcarboxylate	No	MCI.
Mixed t-α-alkylcarboxylic acid salts	No	MCI.
Zinc t-α-alkylcarboxylate	No	MCI.
Zirconium t-α-alkylcarboxylate	No	MCI.
All other t-α-alkylcarboxylic acid salts (isocarboxylic acid salts)	No	MCI.
Isooctanoic acid salts:		
Isooctanoic acid, lead salt	No	CCA.
Isooctanoic acid, manganese salt	No	CCA.
Isooctanoic acid, calcium salt	No	CCA.
Lactic acid salts:		
Ammonium lactate	No	WM.
Sodium lactate (Nalac)	No	PFN.
Lauric acid salts:	Yes	
Barium cadmium laurate	No	FER, WTC.
Barium laurate	No	SYP.
Cadmium laurate	No	SYP.
Dibutyltin dilaurate	No	WTC, (2).
Lauric acid, zinc salt	No	SYP.
Tin laurate	No	FER.
Linoleic acid salts:		
Calcium linoleate	No	CCA.
Maleic acid salts:		
Dibutyltin maleate	No	WTC.
Tribasic lead maleate	No	ALI.
Mercaptoacetic acid (Thioglycolic acid) salts:		
Ammonium mercaptoacetate	No	EVN, WTC.
Calcium mercaptoacetate	No	EVN.
Sodium mercaptoacetate	No	EVN, (2).
All other mercaptoacetic acid (Thioglycolic acid) salts	No	CCA.
Neodecanoic acid salts:		
Bismuth neodecanoate	No	COS, SHP.
Calcium neodecanoate	Yes	CCA, FER, MCI, SHP.
Cobalt neodecanoate	No	MCI, SHP.
Lead-cobalt neodecanoate	No	MCI.
Lead neodecanoate	No	MCI.
Lithium neodecanoate	No	MCI.
Manganese neodecanoate	No	MCI, SHP.
Rare earths neodecanoate	No	MCI.
Zinc neodecanoate	No	SHP.
Zirconium neodecanoate	No	MCI, SHP.
Octanoic-acid (caprylic acid) salts:		
Aluminum octanoate	No	SYP, WTC.
Oleic acid salts:	Yes	
Calcium oleate	No	(2).
Copper oleate	No	MCI.
Sodium oleate	No	WTC.
Oxalic acid salts:		
Ammonium oxalate	No	BKC, HML, WTK.
Potassium oxalate	Yes	BKC, HML, WTK.
Sodium oxalate	No	BKC, HML, WTK.

See footnotes at end of table.

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous cyclic and acyclic chemicals	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 47)*
Acyclic—Continued		
Salts of organic acids—Continued		
Pelargonic acid, calcium salt (Calcium nonoate)	No	SYP.
Phosphorodithioic acid salts (dithiophosphates):		
Potassium dihexyl phosphorodithioate	No	ACY.
Sodium di-sec-butyl/diethyl phosphorodithioate	No	ACY.
Sodium di-sec-butyl phosphorodithioate	No	ACY, ELC.
Sodium diethyl phosphorodithioate	No	ACY.
Sodium dihexyl phosphorodithioate	No	ACY.
Sodium diisobutyl phosphorodithioate	No	ELC.
Sodium diisopropyl phosphorodithioate	No	ACY.
Propionic acid salts:	Yes	
Calcium propionate	Yes	HFT, KMI, NCC.
Sodium propionate	No	HFT, NCC.
All other propionic acid salts	No	MCK.
Ricinoleic acid salts:		
All other ricinoleic acid salts	No	CAS.
Sodium-N-methyl-N-oleyl taurate	No	WPG.
Sodium d1-2-sulfosuccinate	No	WPG.
Stearic acid salts:	Yes	
Aluminum stearates:	Yes	
Aluminum distearate	No	MAL, NOC, NOD, SYP.
Aluminum monostearate	No	MAL, NOD, SYP.
Aluminum tristearate	Yes	MAL, NOC, NOD, SYP, WTC, (2).
Ammonium stearate	No	WPG.
Barium stearate	Yes	ALI, NOC, NOD, SYP, WTC.
Cadmium stearate	No	SYP, VNC, WTC.
Calcium stearate	Yes	ALI, FER, MAL, NOC, NOD, SQA, SYP, WTC.
Cobalt stearate	No	MCI, SHP.
Lead stearate	No	ALI.
Lead stearate, dibasic	No	ALI.
Lithium stearate	No	NOC, WTC.
Magnesium stearate	Yes	ALI, MAL, NOC, NOD, SYP, WTC.
Potassium stearate	No	WTC.
Sodium stearate	No	WTC.
Strontium stearate	No	WTC.
Zinc stearate	Yes	CCC, MAL, NOC, NOD, PLS, SYP, WTC.
Tartaric acid salts:		
Potassium sodium tartrate	No	PFZ.
Sodium bitartrate	No	EKX.
All other tartaric acid salts	No	RSA.
Thioacetic acid, potassium salt	No	RSA.
All other salts of organic acids	No	EK, EKX, FER, TCH.
Aldehydes:		
Acetaldehyde	No	EKX, HCL, UCC.
Acrolein (Acrylaldehyde)	No	UCC.
Butyraldehyde	Yes	BAS, EKX, HCL, UCC.
Crotonaldehyde	No	EKT.
2-Ethylhexanal (α-Ethylcaproaldehyde)	No	EKX, HCL, UCC.
Formaldehyde (37% HCHO by weight)	Yes	BOR, CBD, DGC, DUP, GAF, GP, HCL, HPC, IMC, MON, WCL.
Glutaraldehyde	No	UCC.
Glyoxal	No	ACY.
Isobutyraldehyde	No	BAS, HCL, TU, UCC.
Propionaldehyde	No	EKX, HCL, UCC.
Valeraldehyde (Pentanal)	No	UCC.
All other aldehydes, acyclic	No	UCC.

See footnotes at end of table.

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous cyclic and acyclic chemicals	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 47)*
Acyclic—Continued		
Ketones:		
Acetone	Yes	ACS, ART, ATR, BTL, DOW, ENJ, GE, GGC, SHC, SKO, UCC.
5-Chloro-2-pentanone	No	SDW.
1-Chloropinacolone	No	CHG.
Chloro-2-propanone (Chloroacetone)	No	MRK.
Diisopropyl ketone (2,4-Dimethyl-3-pentanone)	No	EKX.
2-Heptanone (Methyl amyl ketone)	No	EKT.
4-Hydroxy-4-methyl-2-pentanone (Diacetone alcohol)	No	HCL, SHC, UCC.
Isovalerone (Diisobutyl ketone)	No	EKT, UCC.
Methyl ethyl ketone	Yes	ATR, ENJ, LYP, SHC, UCC.
5-Methyl-2-hexanone (Methyl isoamyl ketone)	No	EKT.
Methylhexyl ketone	No	UPM.
Methyl isobutyl ketone	Yes	EKT, EKX, ENJ, SHC, UCC.
4-Methyl-3-penten-2-one (Mesityl oxide)	No	UCC.
Methylpseudoionone	No	NCI.
2-Octanone (Hexyl methyl ketone)	No	WTH.
2,4-Pentanedione (Acetylacetone)	No	UCC.
3-Pentanone (Diethyl ketone)	No	EKT, ORT, UCC.
Pseudoionone	No	NCI, SCM.
2,6,8-Trimethyl-4-nonanone (Isobutyl heptyl ketone)	No	UCC.
All other ketones	No	COC, EK.
Alcohols, monohydric, unsubstituted:		
Alcohols, C_{11} or lower, unmixed (95% or more pure):	Yes	
Allyl alcohol	No	FMC.
Amyl alcohols:		
Amyl alcohol, primary	No	UCC.
2-Methyl-1-butanol	No	CPS, UCC.
1-Pentanol	No	UCC.
Butyl alcohols:	Yes	
n-Butyl alcohol (n-Propylcarbinol)	Yes	BAS, CXI, EKX, GAF, HCL, SHC, UCC, VST.
sec-Butyl alcohol (Methylethylcarbinol)	No	ENJ, GAF, SHC.
tert-Butyl alcohol (Trimethylcarbinol)	No	ATR, CXI.
Isobutyl alcohol (Isopropylcarbinol)	Yes	ART, BAS, CPS, EKX, HCL, SHC, UCC.
1-Decanol	No	TNA, VST.
Diisobutyl alcohol	No	UCC.
2,2-Dimethylbutanol (Isohexyl alcohol)	No	ENJ.
1-Docosanol (Behenyl alcohol, C_{22})	No	SHX.
Ethyl alcohol, synthetic	Yes	DOW, EKX, UCC, USI, VST.
2-Ethyl-1-hexanol	Yes	ART, BAS, EKX, SHC, TU, UCC.
n-Heptyl alcohol	No	EKX.
n-Hexyl alcohol	No	TNA, VST.
Isodecyl alcohol	No	ENJ.
Isoheptyl alcohol	No	ENJ.
Isononyl alcohol	No	ENJ.
Iso-octadecyl alcohol	No	SHX.
Iso-octyl alcohol	No	ENJ.
Isopropyl alcohol	Yes	ATR, ENJ, LYP, SHC, UCC.
Methanol, synthetic	Yes	AIP, BCP, DUP, EKT, ENJ, GGC, HCL, LYP.
Methyl amyl alcohol	No	UCC.
2-Methyl-1-pentanol	No	UCC.
4-Methyl-2-pentanol (1-Methylisobutylcarbinol)	No	ENJ, UCC.
1-Octanol	No	TNA, VST.
Propyl alcohol (Propanol)	Yes	EKX, HCL, UCC, WTH.
2-Propyn-1-ol (Propargyl alcohol)	No	GAF.
Undecanol (linear C_{11} alcohol)	No	BAS, ENJ.
All other alcohols, unmixed C_{11} or lower	No	EKT, SHC, UCC.

See footnotes at end of table.

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous cyclic and acyclic chemicals	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 47)*
Acyclic—Continued		
Alcohols, monohydric, unsubstituted—Continued		
Alcohols C_{12} or higher, unmixed (95% or more pure):	Yes	
Dodecyl alcohol (Lauryl alcohol)	Yes	PG, TNA, VST.
1-Hexadecanol (Cetyl alcohol)	Yes	AAC, ENJ, PG, VST.
1-Octadecanol (Stearyl alcohol)	No	AAC, ENJ, PG, TNA, VST.
cis-9-Octadecen-1-ol (Oleyl alcohol)	No	SHX.
1-Tetradecanol (Myristyl alcohol)	No	VST.
1-Tridecanol	No	ENJ.
2,6,8-Trimethyl-4-nonanol	No	UCC.
Mixtures of alcohols:	Yes	
Mixtures of alcohols, C_{12} and higher	Yes	PG, SHC, SHX, TNA, VST.
All other alcohol mixtures	Yes	AAC, BAS, ENJ, NCI, PG, SCP, SHC, TNA, UCC, VST, WTK.
Esters of monohydric alcohols:		
Acrylic monomers, mixed	No	AAC, CPS.
C_{12}-C_{15} Alcohol esters of lactic acid	No	VND.
Allyl methacrylate	Yes	AAC, BRD, CPS.
Amyl acetates:		
Amyl acetate (n-Pentyl acetate)	No	UCC.
All other amyl acetates	No	WTL.
Butyl acetates:		
n-Butyl acetate	Yes	BAS, EKT, HCL, UCC.
Isobutyl acetate	Yes	BAS, EKT, EKX, HCL, UCC.
Butyl acrylate	Yes	BAS, HCL, RH, UCC.
sec-Butyl chloroformate	No	PPG, VCM, WTL.
Butyl lactate	No	CPS.
Butyl levulinate	No	SOM.
Butyl maleate	No	TCH.
Butyl mercaptopropionate	No	EVN.
Butyl methacrylate	No	DUP, RH.
Butyl oleate	No	ELC.
n-Butyl perchlorocrotonate	No	MAL.
Cetyleicosyl methacrylate	No	RH.
Diallyl maleate	No	AAC, FMC.
Dibutyl maleate	No	ART, NOD.
Didecyl adipate	No	QCP.
Diethyl carbonate (Ethyl carbonate)	No	PPG.
Di(2-ethyl-1-hexyl) maleate	Yes	BRI, CHP, FTX.
Diethyl maleate	No	ACY.
Diethyl oxalate (Ethyl oxalate)	No	([2]).
Dilauryl-3,3'-thiodipropionate	Yes	CCW, EVN, WTC.
Dimethyl carbonate	No	PPG.
Dimethyl maleate	No	AAC.
Dimyristyl-3,3'-thiodipropionate	Yes	CCW.
Dioctyl maleate	No	ART, NOD.
Distearyl-3,3'-thiodipropionate	No	CCW, EVN, WTC.
Dithiobis(stearyl propionate)	No	EVN.
Ditridecyl maleate	No	EFH.
Di(tridecyl)-3,3'-thiodipropionate	No	EVN, WTC.
Dodecylpentadecyl methacrylate	No	RH.
Dodecyl succinic lactate	No	SM.
2-Ethoxyethyl acetate	No	UCC.
Ethyl acetate (100% basis)	Yes	EKT, EKX, HCL, MON.
Ethyl acetoacetate	No	EKT.
Ethyl acrylate	Yes	BAS, HCL, RH, UCC.
Ethyl chloroformate	No	PPG.
Ethyl chlorothiolformate	No	ICI.
Ethylene carbonate	No	TX.

See footnotes at end of table.

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous cyclic and acyclic chemicals	Separate statistics[1]	Manufacturers' identification codes (according to list in table 47)
Acyclic—Continued		
Esters of monohydric alcohols—Continued		
Ethyl 3-ethoxy propionate	No	UCC.
2-Ethyl-1-hexyl acetate	No.	EKT.
2-Ethyl-1-hexyl acrylate	Yes	BAS, HCL, UCC, VCM.
2-Ethylhexyl chloroformate	Yes	HCL, PPG, WTL.
2-Ethyl-1-hexyl methacrylate	No	DUP.
Ethyl methacrylate	No	DUP.
Ethyl sulfate (Diethyl sulfate)	No	UCC.
Fatty acid esters, not included with plasticizers or surface active agents:	Yes	
Diglycol dimerate	No	WTC.
Diisopropyl dimerate	No	SBC.
Diisostearyl dimerate	No	SBC.
Dioctyl dimerate	No	WTC.
Docosanyl docosenoate	No	SBC.
2-Ethylhexyl stearate	No	BRI.
Isocetyl stearate	No	VND.
Isopropyl linoleate	No	VND.
Isostearyl isostearate	No	SBC.
Methyl esters of coconut oil	No	WTC.
Methyl esters of lard	No	FER.
Methyl esters of tallow	No	CHL, FER.
Methyl 12-hydroxystearate	No	CAS, WTH.
Methyl iso-octadecenoate	No	SYL.
Methyl linoleate	No	HRT.
Methyl stearate	No	CHL, WTC.
Myristyl myristate	Yes	AAC, SBC, VND.
Myristyl stearate	No	AAC.
Stearyl stearate	No	AAC.
Tridecyl stearate	Yes	HCL, RPC, WTC.
All other fatty acid esters, not included with plasticizers surface-active agents	No	ALI, HDG, HPC.
Hexyl acetate	No	CPS, ENJ.
Isobutyl acrylate	No	BAS.
Isobutyl chloroformate	No	PPG, VCM.
Isobutyl isobutyrate	No	EKX.
Isobutyl methacrylate	No	RH.
Isodecyl acrylate	No	CPS.
Isodecyl mercaptoacetate	No	EVN.
Isodecyl methacrylate	No	RH.
Iso-octyl mercaptoacetate	No	CCW, EVN.
Iso-octyl-3-mercaptopropionate	No	EVN.
Isopropyl acetate	Yes	EKT, HCL, UCC.
Isopropyl chloroformate	Yes	PPG, VCM, WTL.
Isostearyl neopentanoate	No	SBC, VND.
Lauryl lactate	No	VND.
Lauryl methacrylate	Yes	AAC, CPS, RH.
1-Methoxy-2-ethyl acetate	No	EKX.
2-Methoxyethyl acrylate	No	CPS.
Methyl acetoacetate	No	EKT.
Methyl acrylate, monomer	No	BAS, HCL.
Methyl chloroformate	No	PPG.
Methyl 3,3-dimethyl-4-pentenoate	No	FMN.
Methyl formate	No	HCL.
Methyl isodehydroacetate	No	EKT.
Methyl methacrylate, monomer	Yes	CYR, DUP, RH.
Methyl sulfate (Dimethyl sulfate)	No	DUP.
Myristyl lactate	No	VND.

See footnotes at end of table.

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous cyclic and acyclic chemicals	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 47)*
Acyclic—Continued		
Esters of monohydric alcohols—Continued		
Octadecyl-3-mercaptopropionate	No	EVN.
Phosphorus acid esters:	Yes	
Amyl hydrogen phosphate	No	HK.
Bis (2-chloroethyl)-2-chloroethylphosphonate	No	ALW.
Bis(2-ethylhexyl)hydrogen phosphite	No	ALW.
Butyl acid phosphate	No	HK.
Chloroalkyl diphosphate ester, neutral	No	ALW.
Chloroalkyl phosphate ester	No	ALW.
Dibutyl butylphosphonate	No	ALW, HDG.
Dibutyl hydrogen phosphite	No	ALW.
Dibutyl pyrophosphate	No	ALW.
Diethylhexyl phosphoric acid	No	ALW.
Diethyl hydrogen phosphite	No	ALW.
Diethyl phosphenothionic dichloride	No	TNA.
Diethyl phosphorochloridothionate	No	ICI, TNA.
Dimethyl hydrogen phosphite	No	ALW.
Dimethyl methylphosphonate	No	ALW, HDG.
Dimethyl phosphoridothionate	No	ICI.
Dioleyl hydrogen phosphite	No	EKT.
2-Ethylhexyl hydrogen phosphate	No	ALW.
Iso-octyl hydrogen phosphate	No	ALW.
Methyl dihydrogen phosphate	No	HK.
Mixed dialkyl hydrogen phosphates	No	ELC.
Stearyl acid phosphate	No	HK.
Tetrakis(2-chloroethyl)ethylene diphosphate	No	OMC.
Tetrakis(2-chloroisopropyl)ethylene diphosphate (T-RDT)	No	OMC.
Trialkyl phosphite	No	MCB.
Trialkyl thiophosphite	No	MCB.
Tributyl phosphate	No	FMC.
Triethyl phosphite	No	ALW, ICI.
Triisodecylphosphite	No	WTC.
Triiso-octyl phosphite	Yes	ALW, MCB, TX.
Triisopropyl phosphite	No	ALW.
Trimethyl phosphite	No	ALW, ICI.
Tris(2-chloroethyl)phosphate	No	PEL.
Tris(2-chloroethyl) phosphite	No	ALW, OMC.
Tris-2-chloropropyl phosphate	No	ALW, PEL.
Tris(2-ethylhexyl)phosphite	No	ALW.
All other phosphorus acid esters	No	ALW, ART, AZT, ([2]).
Propyl acetate	Yes	BAS, EKT, HCL, UCC.
Propyl chlorothioformate	No	ICI.
Propylene carbonate	No	TX.
Stearyl methacrylate	No	CPS, RH, TX.
Tetraethyl orthosilicate (Tetraethyl silicate)	No	UCC.
Tetrapropyl silicate	No	NOD, UCC.
Titanic acid esters:		
Bis[2-(bis[2-hydroxyethyl]amino)ethyl]diisopropyl titanate	No	DUP.
Bis(ethyl-3-oxobutanato)bis(2-propanolato) titanium	No	DUP.
Di(hydroxy)bis(ammoniumlactato)titanium	No	DUP.
Tetrabutyl titanate	No	DUP.
Tetraisopropyl titanate	No	DUP.
Tetrakis(2-ethylhexyl)titanate	No	DUP, NOD.
Triethanolamine titanate	No	NOD.
All other titanic acid esters	No	BUC, DUP.

See footnotes at end of table.

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous cyclic and acyclic chemicals	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 47)*
Acyclic—Continued		
Esters of monohydric alcohols—Continued		
Triethyl orthoacetate	No	NOD.
Triethyl orthoformate	No	NOD.
Triethyl orthopropionate	No	NOD.
Trimethyl orthoacetate	No	NOD.
Trimethyl orthoformate	No	NOD.
Vinyl acetate, monomer	Yes	DUP, FER, HCL, UCC, USI.
All other monohydric alcohol esters	Yes	AAC, BAS, COC, EKT, ENJ, MON, PD, VND, (2).
Polyhydric alcohols:	Yes	
2,2-Bis(bromomethyl)-1,3-propanediol	No	DOW.
1,2(and 1,3)-Butanediol	No	HCL.
1,4-Butanediol	Yes	BAS, DUP, GAF.
2-Butene-1,4-diol	No	DIX, GAF.
2-Butyne-1,4-diol	No	BAS, GAF.
3-Chloro-1,2-propanediol (Glycerol α-chlorohydrin)	No	AAC, DIX, EVN.
2,2-Dimethyl-1,3-propanediol (Neopentyl glycol)	No	BAS, EKX.
Ethylene glycol	Yes	BAS, CNE, CXI, DOW, DUP, EKX, HCF, HCL, OMC, PDG, PLC, SHC, TX, UCC, USI.
2-Ethyl-1,3-hexanediol	No	UCC.
2-Ethyl-2-(hydroxymethyl)-1,3-propanediol (Trimethylolpropane)	No	HCL.
Glycerol, synthetic only	No	DOW, SYP.
1,6-Hexanediol	No	BAS, CXI, WTL.
2-(Hydroxymethyl)-2-methyl-1,3-propanediol (Trimethylolethane)	No	IMC.
Mannitol	No	ICI.
3-Mercapto-1,2-propanediol (Thioglycerol)	No	EVN.
2-Methyl-2,4-pentanediol (Hexylene glycol)	No	SHC, UCC.
Pentaerythritol	Yes	HCL, HPC, PST.
1,5-Pentanediol	No	BAS.
Propylene glycol (1,2-Propanediol)	Yes	ATR, DOW, OMC, TX, UCC.
Sorbitol (70% by Weight)	No	EHC, ICI, PFZ.
2,2,4-Trimethyl-1,3-pentanediol	No	EKX.
All other polyhydric alcohols	No	ARC, EK, ICI, SHC.
Esters and ethers of polyhydric alcohols:		
Polyhydric alcohol esters:	Yes	
2-(2-Butoxyethoxy)ethyl acetate	No	EKT, UCC.
2-Butoxyethyl acetate	No	EKT, UCC.
1,3-Butylene glycol diborate	No	USB.
1,3-Butylene glycol diborate/hexylene glycol boric anhydride	No	USB.
Diethylene glycol adipate	No	CMB, HAL.
Diethylene glycol, borated	No	OMC.
Diethylene glycol chloroformate	No	ICI, PPG.
Diethylene glycol dimethacrylate	No	CPS.
2-(2-Ethoxyethoxy)ethyl acetate	No	EKT.
Ethylene glycol diacetate	No	EKT.
Ethylene glycol diacrylate	No	CPS.
Ethylene glycol dimercaptoacetate	No	EVN.
Ethylene glycol dimethacrylate	No	CPS.
Glycerides, C_{14}-C_{19} and C_{16}-C_{18} mono- and di-	No	SHX, WTC.
Glycerides, mono, mixed	No	WTC.
Glycerol propoxylate triacrylate	No	REZ.
Glyceryl diacetate (Diacetin)	No	HAL.
Glyceryl monoacetate (Monoacetin)	No	HAL.
Glyceryl monothioglycolate	No	EVN, WTC.
Glyceryl triacetate (Triacetin)	No	EKT.

See footnotes at end of table.

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous cyclic and acyclic chemicals	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 47)*
Acyclic—Continued		
Esters and ethers of polyhydric alcohols—Continued		
Polyhydric alcohol esters—Continued	Yes	
Glyceryl tristearate	No	BRD.
1,6-Hexanediol diacrylate	No	REZ.
Hydroxyethyl acrylate	No	DOW, RH.
Hydroxyethyl methacrylate	No	RH.
Hydroxypropyl acrylate	No	DOW, RH.
Hydroxypropyl methacrylate	No	AAC, RH.
2-Methoxyethyl acetate	No	UCC.
Nopeopentyl glycol dicaprate	No	SBC.
Pentaerythritol stearate	No	BRD.
Pentaerythritol tetraacrylate	No	REZ.
Pentaerythritol tetrakis (3-Mercaptopropionate)	No	EVN.
Polyethylene glycol dimethacrylate	No	SQA.
Sucrose octa-acetate	No	HFT.
Tetraethylene glycol diacrylate	No	REZ.
Tetraethylene glycol dimethacrylate	No	AAC.
Trimethylolpropane decanoic acid ester	No	SM.
Trimethylolpropane ethoxylate triacrylate	No	REZ.
Trimethylolpropane triacrylate	No	AAC, CPS, REZ.
Trimethylolpropane tri(2-mercaptopropionate)	No	EVN.
Trimethylolpropane trimethacrylate	No	CPS.
Trimethylolpropane trioleate (TMP trioleate)	No	EFH.
2,2,3-Trimethyl-1,3-pentanediol monoisobutyrate	No	EKX.
Tripropylene glycol diacrylate	No	REZ.
All other polyhydric alcohol esters	No	AAC, SQA, VDM.
Polyhydric alcohol ethers:	Yes	
Bis(2-butoxyethyl)ether (Diethylene glycol di-n-butyl ether)	No	ASL, FER.
Bis(2-ethoxyethyl)ether (Diethylene glycol diethyl ether)	No	ASL, DRC, FER.
Bis2-(2-methoxyethoxy)ethyl ether (Tetraethylene glycol dimethyl ether)	No	ASL, FER.
Bis(2-methoxyethyl)ether (Diethylene glycol dimethyl ether)	No	ASL, FER.
2-Butoxyethanol (Ethylene glycol monobutyl ether)	Yes	CNE, DOW, EKX, OMC, SHC, UCC.
2-(2-Butoxyethoxy)ethanol (Diethylene glycol monobutyl ether)	Yes	DOW, EKX, OMC, SHC, UCC.
2-[2-(2-Butoxyethoxy)ethoxy]ethanol (Triethylene glycol monobutyl ether)	Yes	DOW, OMC, UCC.
1-Butoxyethoxy-2-propanol	No	UCC.
Butyl ethers of tetra- and higher ethylene glycols (high boiling)	No	EKX.
I-Butyraldehyde trimer	No	HTM.
Diethylene glycol	Yes	BAS, CNE, CXI, DOW, DUP, EKX, HCL, OMC, PDG, SHC, TX, UCC USI.
Diethylene glycol divinyl ether	No	GAF.
Diethylene glycol mono-n-propyl ether	No	EKX.
Difunctional epoxy acrylate	No	SQA.
Dimethoxyethane (Ethylene glycol dimethyl ether)	No	ASL, FER.
Dipropylene glycol	Yes	ATR, DOW, OMC, UCC.
Dipropylene glycol monomethyl ether	No	OMC.
2-Ethoxyethanol (Ethylene glycol monoethyl ether)	No	EKX, OMC, UCC.
2-(2-Ethoxyethoxy)ethanol (Diethylene glycol monoethyl ether)	Yes	DOW, EKX, OMC, UCC.
2-[2-(2-Ethoxyethoxy)ethoxyethanol (Triethylene glycol monoethyl ether)	No	DOW, OMC, UCC.

See footnotes at end of table.

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous cyclic and acyclic chemicals	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 47)*
Acyclic—Continued		
Ester and ethers of polyhydric alcohols—Continued		
Polyhydric alcohols ethers—Continued		
Ethylene glycol di-tributyl ether	No	EKX.
Ethylene glycol di-tri-ethyl ether	No	EKX.
Ethyl ethers of tetra and higher ethylene glycols (high boiling)	No	EKX, OMC.
2-[2-(Hexyloxy)ethoxy]ethanol	No	UCC.
2-Methoxyethanol (Ethylene glycol monomethyl ether)	No	OMC, UCC.
2-(2-Methoxyethoxy)ethanol (Diethylene glycol mono-methyl ether)	Yes	DOW, OMC, UCC.
2-[2-(2-Methoxyethoxy)ethoxy]ethanol (Triethylene glycol monomethyl ether)	Yes	DOW, OMC, UCC.
2-(2-Methoxyethoxy)ethyl-2-methoxyethyl ether (Triethylene glycol dimethyl ether)	No	ASL, FER, OMC.
Methoxypolyethylene glycol	No	ICI, UCC.
1-Methoxy-2-propanol	No	OMC.
Methoxypropyl acetate	No	EKT, HTM.
Paraformaldehyde	No	HCL.
Polyethylene glycol	Yes	ABB, DOW, GAF, HCL, HDG, OMC, PPG, UCC, (2), (2).
Polyethylene glycol butyl ether, propoxylated	No	ICI.
Polyethylene glycol dimethyl ether	No	SHX, (2).
Polyglycols, ethylene glycol and glycol ether, mixed	No	CXI, HCL, UCC, (2).
Polymethylvinyl ether monoethylmaleate	No	TNI.
Polyoxyalkylene glycol	No	OMC.
Poly(oxy-1,2-ethanediyl), α-hydro-ω-hydroxy; $(C_2H_4O)nH_2O$)	No	SHX.
Polypropoxy ethers:		
Poly(propoxy)butyl ether, ethoxylated	No	TX.
Polyoxypropylene-polyoxyethylene glycol, mixed	No	UCC.
Polypropylene glycol	No	DOW, GAF, HCL, HDG, OMC, PPG, (2).
Polypropylene glycol glycerol tri-ether	No	(2).
Polytetramethylene glycol ether	Yes	BAS, DUP, QKO.
Propoxyethanol (Ethylene glycol monopropyl ether)	No	EKX.
Propylene glycol, alkoxylated	No	(2).
Propylene glycol t-butyl ether	No	HTM.
Sorbitol, alkoxylated	No	(2).
Sorbitol, ethoxylated	No	BRD, ICI, (2).
Sorbitol monooleate	No	WTC.
Sorbitol monostearate	No	WTC.
Sorbitol, propoxylated	No	ICI.
Tetraethylene glycol	No	DOW, EKX.
Tetra/penta glycols, mixed	No	CXI.
2,2'-Thiodiethanol (Thiodiglycol)	No	AAC, PLC.
Triethylene glycol	Yes	CNE, CXI, DOW, EKX, HCL, PDG, PLC, SHC, TX, UCC.
Tripropylene glycol	No	DOW, UCC.
Tripropylene glycol monomethyl ether	No	OMC.
Tri- and tetraethylene glycol monoethyl ethers, borate esters	No	OMC.
All other polyhydric alcohol ethers	No	AAC, DUP, MIL, OMC, UCC, (2).
Brominated, chlorinated and fluorinated hydrocarbons:		
Brominated (including bromochlorinated) hydrocarbons:	Yes	
1-Bromobutane (n-Butyl bromide)	No	DAZ.
Bromochloromethane	No	DOW.
Bromoethane (Ethyl bromide)	No	DOW, GTL.
1-Bromohexadecane	No	HMY.

See footnotes at end of table.

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous cyclic and acyclic chemicals	Separate statistics[1]	Manufacturers' identification codes (according to list in table 47)
Acyclic—Continued		
Brominated, chlorinated and fluorinated hydrocarbons—Cont.		
Brominated (including bromochlorinated) hydrocarbons—Continued	Yes	
1-Bromo-2-methyl-2-butene	No	SD.
1-Bromo-octadecane	No	HMY.
1-Bromopentane (n-Amyl bromide)	No	WCC.
1-Bromopropane (n-Propyl bromide)	No	DAZ.
2-Bromopropane (Isopropyl bromide)	No	WCC.
Dibromomethane (Methylene bromide)	No	DOW.
Ethylene bis tetrabrom	No	TNA.
Myristyl bromide	No	WCC.
1,1,2,2-Tetrabromoethane (Acetylene tetrabromide)	No	DOW.
Vinyl bromide (Bromoethylene)	No	TNA.
All other brominated (including bromochlorinated) hydrocarbons	No	COC, FER, HMY, TNA.
Chlorinated (not otherwise halogenated) hydrocarbons:		
Carbon tetrachloride	Yes	DOW, FRO, HK, LCP, SFI.
Chlorinated paraffins (C_{10}-C_{30}):		
Chlorinated paraffins, 35-64% chlorine	Yes	DVC, FER, HK.
Chlorinated paraffins, less than 35% chlorine	No	DVC, FER, SHC.
Chlorinated paraffins, 65% or more chlorine	Yes	DVC, FER, HK.
1-Chlorobutane (n-Butyl chloride)	No	ALW, UCC.
Chloroform	Yes	DOW, FRO, HK, LCP.
Chloromethane (Methyl chloride)	Yes	DCC, DOW, FRO, HK, LCP, SPD, VST.
3-Chloro-2-methyl-1-propene (Methallyl chloride)	No	FMC.
3-Chloropropene (Allyl chloride)	No	DOW, SHC.
1,2-Dichloroethane (Ethylene dichloride)	Yes	BCP, BFG, DOW, FOR, FRO, GGC, HK, OMC, PPG, SHC, VST.
1,2-Dichloropropane (Propylene dichloride)	No	DOW.
2,3-Dichloropropene	No	DOW, SHC.
2,2-Dimethylchloropropane(neopentyl chloride)	No	ALD.
Ethyl chloride (Chloroethane)	Yes	DOW, DUP, PPG, TNA.
2-Ethylhexyl chloride	No	ALW.
Methylene chloride (Dichloromethane)	Yes	DOW, FRO, HK, LCP.
Neophyl chloride	No	TNA.
Octyl chloride	No	TNA.
Paraffin oils, chlorinated	No	BAS.
Perchloroethylene (Tetrachloroethane)	Yes	DOW, FRO, HK, MIL, PPG.
1,1,1-Trichloroethane (Methyl chloroform)	Yes	DOW, FRO, PPG.
1,1,2-Trichloroethane (Vinyl trichloride)	No	DOW.
Trichloroethylene	No	DOW, PPG.
Vinyl chloride, monomer (Chloroethylene)	Yes	BCP, BFG, DOW, FOR, GGC, HK, PPG, VST.
Vinylidene chloride, monomer (1,1-Dichloroethylene)	No	DOW, PPG.
All other chlorinated (not otherwise halogenated) hydrocarbons	No	COC, ([2]).
Fluorinated (including other fluorohalogenated) hydrocarbons:	Yes	
Bromochlorodifluoromethane	No	GTL, ICI.
2-Bromo-1-chloro-1,2,2-trifluoroethane	No	HOC.
2-Bromo-2-chloro-1,1,1-trifluoroethane (Halothane)	No	HOC.
Bromotrifluoromethane	No	DUP, GTL.
1-Chloro-1,1-difluoroethane (F-142b)	No	PAS.
Chlorodifluoromethane (F-22)	Yes	ACS, DUP, KAI, LRO, PAS, RCN.
Chlorotrifluoroethylene (Trifluorovinyl chloride)	No	ACS.
2-Chloro-1,1,2-trifluoroethyl methyl ether	No	OH.
Chlorotrifluoromethane (F-13)	No	DUP.

See footnotes at end of table.

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous cyclic and acyclic chemicals	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 47)*
Acyclic—Continued		
Brominated, chlorinated, and fluorinated hydrocarbons—Continued		
Fluorinated (including other fluorohalogenated) hydrocarbons—Continued	Yes	
Dibromodifluoromethane	No	GTL.
Dichlorodifluoromethane (F-12)	Yes	ACS, DUP, KAI, LRO, PAS, RCN.
Dichlorotetrafluoroethane (F-114)	No	ACS, DUP.
1,1-Difluoroethane	No	DUP.
Hexafluoropropylene, monomer	No	DUP.
1-Iodoperfluorohexane	No	DUP.
Polytetrafluoroethylene ethyl iodide	No	([2]).
Tetrafluoroethylene, monomer (F-1114)	No	DUP, ICI.
Tetrafluoromethane (F-14)	No	DUP.
Trichlorofluoromethane (F-11)	Yes	ACS, DUP, KAI, LRO, PAS, RCN.
Trichlorotrifluoroethane (F-113)	No	ACS, DUP, PAS.
Trifluoropropene	No	HOC.
Vinyl fluoride, monomer	No	DUP.
Vinylidene fluoride, monomer	No	PAS.
All other fluorinated (including other fluorohalogenated) hydrocarbons	No	COC, DUP, HOC, REG.
Other miscellaneous acyclic chemicals:		
Iodinated (not otherwise halogenated) hydrocarbons:		
Diiodomethane (Methylene iodide)	No	DPW.
Iodobutane	No	RSA.
Iodoethane (Ethyl iodide), non-medical	No	DPW, RSA.
Iodomethane (Methyl iodide)	No	DPW, RSA.
Isopropyl iodide	No	DPW.
All other iodinated (not otherwise halogenated) hydrocarbons	No	COC, DPW, RSA.
Acetylacetonates:		
Cobaltic acetylacetonate	No	SHP.
Titanium acetylacetonate	No	NOD.
All other acetylacetonates	No	SHP.
Acetylacetonates complexes:		
Aluminum acetylacetonate complex	No	MCK.
Iron acetylacetonate complex	No	MCK.
Zinc acetylacetonate complex	No	MCK.
Acyclic peroxides:	Yes	
Acetylacetone peroxide	No	CAD.
tert-Amyl hydroperoxide	No	WTC.
2-Butanone peroxide (MEK peroxide)	Yes	CAD, FRE, NOC, WTC, WTL.
n-Butyl-4,4-bis[t-butylperoxy]valerate	No	WTL.
tert-Butyl hydroperoxide	No	ATR, AZT, FRE, WTL.
tert-Butyl peroxide (Di-tert-butyl peroxide)	Yes	AZT, WTC, WTL.
tert-Butyl peroxyacetate	No	AZT.
tert-Butyl peroxy-2-ethylhexanoate	No	WTC, WTL.
tert-Butyl peroxyisobutyrate	No	WTL.
tert-Butyl peroxyisopropylcarbonate	No	WTL.
tert-Butylperoxymaleic acid	No	WTC, WTL.
tert-Butyl peroxyneodecanoate	No	WTC, WTL.
tert-Butyl peroxypivalate	Yes	AZT, WTC, WTL.
Decanoyl peroxide	No	WTL.
Di(sec-butyl)peroxydicarbonate	No	WTL.
Di-(2-ethylhexyl) peroxydicarbonate	No	WTC, WTL.
Diisononanoyl peroxide	No	WTL.
2,5-Dimethyl-2,5-di(tert-butylperoxy)hexane	No	WTL.
2,5-Dimethyl-2,5-di(tert-butylperoxy)hexyne-3	No	WTL.

See footnotes at end of table.

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous cyclic and acyclic chemicals	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 47)*
Acyclic—Continued		
Other miscellaneous acyclic chemcials—Continued		
Acyclic peroxides—Continued		
2,5-Dimethyl-2,5-di(2-ethylhexanoyl peroxy) hexane	No	WTL.
Di-n-propyl peroxydicarbonate	No	WTL.
Ethyl 3,3-di(t-butyl peroxy) butyrate	No	WTL.
Lauroyl peroxide	No	WTL.
Peroxyacetic acid (Peracetic acid)	No	FMB, FMC, UCC.
Succinyl peroxide	No	WTL.
Tertiary amyl per-2-ethylhexanoate	No	WTC.
All other acyclic peroxides	No	WTC.
Carbon disulfide	No	PAS.
2,3-Dibromopropanol	No	GTL.
1,3-Dichloro-2-propanol	No	ARS.
Epoxides, ethers, and acetals:		
Bis(2-chloroethyl)ether (Dichlorodiethyl ether)	No	BKM.
Butylene oxide	No	DOW.
Butyl vinyl ether	No	GAF.
Chloromethyl methyl ether	No	RH.
2,2-Dichloro-1,1-difluoroethyl methyl ether	No	OH.
Diethoxyethane	No	FER, WPG.
Dimethyl sulfone	No	CRZ.
Epichlorohydrin	No	DOW, SHC.
Ethylene oxide	Yes	BAS, CNE, DOW, EKX, HCL, OMC, SHC, SUN, TX, UCC, USI, VST.
Ethyl ether, absolute	No	EKX, USI.
Ethyl vinyl ether	No	GAF.
Glycidol (2,3-Epoxy-1-propanol)	No	DIX.
Glycidyl ethers:	Yes	
Alkyl glycidyl ethers, C_{12}-C_{14}	No	REZ, TRC, WLN.
Alkyl glycidyl ethers, C_8-C_{10}	No	TRC, WLN.
1-(Allyloxy)-2,3-epoxypropane (Allyl glycidyl ether)	No	AAC, CPS.
1,4-Butanediol diglycidyl ether	No	REZ, TRC, WLN.
1-Butoxy-2,3-epoxypropane (Butyl glycidyl ether)	Yes	CPS, REZ, TRC, WLN.
2-Ethylhexyl glycidyl ether	No	TRC, WLN.
Polyol glycidyl ether	No	REZ, WLN.
All other glycidyl ethers	No	REZ, WLN.
Isopropyl ether	No	ENJ, SHC.
Methylal (Dimethoxymethane)	No	HCL.
Methyl ether (Dimethyl ether)	No	AIP.
Methyl vinyl ether	No	GAF, UCC.
Propylene oxide	No	ATR, DOW.
1,1,3,3-Tetramethoxypropane	No	NOD, UCC.
All other epoxides, ethers, acetals	No	UCC.
2-(Ethylmercapto)ethanol	No	DOM.
Ethyl succinyl chloride	No	CWN.
Fats and oils, chemically modified:	Yes	
Chlorinated fatty materials	No	FER.
Hydrogenated menhaden fish oil	No	CHL, WTC.
Hydrogenated tallow glycerides	No	CHL, WTC.
Sulfurized corn oil	No	SM.
Vegetable glycerides, hydrogenated	No	BRD, WTC.
All other fats and oils, chemically modified	No	CAS, CHL, CJO.
Glutaraldehyde bis(sodium bisulfite)	No	FMT.
Hexadecylsulfonyl chloride	No	EKT.
Hydrocarbons:		
n-Decane	No	HMY, PLC.
n-Dodecane	No	HMY, PLC.

See footnotes at end of table.

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous cyclic and acyclic chemicals	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 47)*
Acyclic—Continued		
Other miscellaneous acyclic chemicals—Continued		
Hydrocarbons—Continued		
Hexadecane	No	HMY.
Myrcene	No	SCM, (2).
n-Nonane	No	HMY.
n-Octadecane	No	HMY.
n-Octane	No	HMY, PLC.
n-Tetradecane	No	HMY.
All other hydrocarbons	No	DUP, HMY, PLC, WTK.
2-Mercaptoethanol	No	AAC, PLC.
Merox disulfide	No	LYP.
Methyl sulfide (Dimethyl sulfide)	No	GAY, PAS.
Methyl sulfoxide (Dimethyl sulfoxide)	No	GAY.
Octadecanoic acid, 2-(1-carboxyehtoxy)-1-methyl-2-oxoethyl ether, sodium salt	No	WTC.
Organo-aluminum compounds:	Yes	
Aluminum diisopropoxide acetoacetic ester chelate	No	CHT, KCH.
Aluminum ethyl-3-oxobutanoato-0^1,0^3-dihydroxy T-4	No	CHT, KCH.
Aluminum isooctoxide, diisopropoxide	No	KCH.
Aluminum isopropoxide (Aluminum isopropylate)	No	CHT, KCH.
Aluminum tri-sec-butoxide	No	CHT.
Diethylaluminum chloride	No	TNA, TSA.
Diethylaluminum dimethylethyl siloxide	No	(2).
Diethyl aluminum ethoxide	No	TSA.
Diethylaluminum iodide	No	TNA, TSA.
Diisobutylaluminum chloride	No	TNA, TSA.
Diisobutylaluminum hydride	No	TNA, TSA.
Di-n-octylaluminum iodide	No	TSA.
Di-n-propylaluminum chloride	No	TSA.
Ethylaluminum dichloride	No	TNA, TSA.
Ethylaluminum sesquichloride	No	TNA, TSA.
Isobutylaluminum chloride	No	TNA, TSA.
Isopropenylaluminum	No	TSA.
Oxoaluminum isopropoxide	No	KCH.
Oxoaluminum stearate	No	KCH.
Oxy-aluminum octanoate	No	CHT, KCH.
Sodium dihydrobis(2-methoxyethoxy)aluminum hydride	No	HXL.
Tri-n-butylaluminum	No	TNA, TSA.
Triethylaluminum	No	TNA, TSA.
Tri-n-hexyl aluminum	No	TNA, TSA.
Triisobutylaluminum	No	TNA, TSA.
Trimethylaluminum	No	TNA.
Tri-n-octylaluminum	No	TNA, TSA.
Tri-oxyaluminum tri-isopropoxide	No	CHT.
All other organo-aluminum compounds	No	KCH, MCB, MRF, TNA.
Organo-boron compounds:	Yes	
Boric acid-amine adducts	No	FER.
Boron trichloride-amine complex (DY 9577)	No	ASL.
N-Methyl-methanamine with borane (1:1)	No	(2).
2-Methyl-2-propanamine with borane(1:1)	No	(2).
Mixed alcohol borates	No	(2).
Triethylborane	No	(2).
Triethyl borate	No	ADC.
Triethylboron	No	TSA.
Trimethoxyboroxine	No	(2).
N,N,N-Trimethyl methanaminium octahydrotriborate	No	(2).
All other organo-boron compounds	No	HCL, MCK, MHI, (2).

See footnotes at end of table.

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous cyclic and acyclic chemicals	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 47)*
Acyclic—Continued		
Other miscellaneous acyclic chemicals—Continued		
Organo-lithium compounds:		
n-Butyllithium	No	FTE.
sec-Butyllithium	No	FTE.
Lithium hydroxystearate	No	WTC.
Organo-magnesium compounds:		
Butyl ethyl magnesium	No	TSA.
Di-n-butylmagnesium	No	TSA.
Di-n-hexyl magnesium	No	TSA.
Magnesium methylate	No	SOI.
All other organo-magnesium compounds	No	(2).
Organo-silicon compounds:		
N-Aminoethylaminopropyl trimethoxysilane	No	NOD.
α-Chloropropyltrichlorosilane	No	DCC.
Chloropropyltrimethoxysilane	Yes	DCC, NOD, UCC.
Chlorotrimethylsilane	No	DCC.
Dichlorodimethylsilane	No	DCC.
Dichloromethylsilane	No	DCC.
Dichloromethylvinylsilane	No	DCC.
Diisobutyl dimethoxychloro silane	No	NOD.
Divinyl tetramethyldisiloxane	No	NOD.
α-Glycidoxypropyltrimethoxysilane	No	NOD, UCC.
Hexamethyldisilazane	No	NOD, SCM.
Isobutyltrimethoxysilane	No	NOD.
Mercaptopropyltrimethoxysilane	No	NOD, UCC.
α-Methacryloxypropyltrimethoxysilane	No	NOD, UCC.
Methyltrimethoxysilane and polymethyltrisiloxane	No	DCC, UCC.
N-Octyltriethoxy silane	No	SCM.
Polyoxyalkene silicones	No	UCC.
Silicone fluids	Yes	DCC, SPD, SWS, UCC.
Trichloromethylsilane	No	DCC.
Trichloropropylsilane	No	DCC.
Trichlorovinylsilane	No	UCC.
(Trimethoxysilyl propyl) didecyl methylammonium chloride	No	NOD.
Trimethylsilyldiazo-methane	No	NOD.
Tris(2-methoxyethoxy)vinyl silane	No	NOD.
Tris(pentamethyldisiloxanyl)-3-methacrylatopropyl-silane	No	(2).
Vinyltriethoxysilane	No	NOD, UCC.
Vinyl trimethoxy silane	No	NOD.
All other organo-silicone compounds	No	ARO, BRI, DUP, GGI, NOD, UCC, (2).
Organo-tin compounds:	Yes	
Dibutyltin bis(isooctylmercaptoacetate)	No	WTC, (2).
Dibutyltin bis(mercaptolaurate)	No	(2).
Dibutyl tin diacetate	No	COS.
Dibutyltin dichloride	No	WTC, (2).
Dibutyl tin dilaurate	No	COS.
Dibutyltin oxide	No	WTC, (2).
Dimethyltin dichloride	No	WTC.
Dimethyltin-IOTG	No	WTC.
Dioctyl tin dilaurate	No	COS.
Monomethyl tin	No	WTC.
Organotin mercaptides	No	CCW.
Tributyltin fluoride	No	(2).
All other organo-tin compounds	No	SCM, (2), (2).

See footnotes at end of table.

Table 46—Continued

Miscellaneous cyclic and acyclic chemicals for which U.S. production and/or sales were either reported or estimated, identified by manufacturer, 1988

Miscellaneous cyclic and acyclic chemicals	*Separate statistics*[1]	*Manufacturers' identification codes (according to list in table 47)*
Acyclic—Continued		
Other miscellaneous acyclic chemicals—Continued		
Organo-zinc compounds:		
Diethylzinc	No	TSA.
Perchloromethanethiol (Perchloromethyl mercaptan)	No	ICI.
Perfluoroalkyl polyether	No	(2).
Phosgene (Carbonyl chloride)	Yes	DUP, ICI, MOB, OMC, PPG.
Pine oil, synthetic	No	NCI.
Polyhexafluoropropylene oxide	No	DUP.
Polymethacrylic acid esters	No	DUP.
Potassium 2-methyl-2-butanol	No	(2).
Potassium 2-methyl-2-propanol	No	(2).
Sodium methoxide (Sodium methylate)	No	HK.
Thioethanol, sodium salt	No	BAS.
Trifluoroethanol	No	HOC.
All other miscellaneous acylic chemicals	No	ASL, CGY, COC, EK, GAF, GPI, HMP, HPC, MCK, NOD, PAH, PIC, RSA, SHX, TCC, TNA, TSA, USR, (2), (2), (2), (2).
Mixtures not specifically itemized:	Yes	
Alcohols, monohydric, and their esters, C_8 and higher	No	EKX.
Butyl formcel	No	HCL.
Celtone	No	HCL.
Fatty acid residues	Yes	DRL, SHX, SYP, WTC.
Gluconic acid and salts, mixed	No	PMP.
Glycol residues	No	OMC.
Methacrylate based cationic polyelectrolytes	No	COS.
Methyl formcel	No	HCL, NOD.
Morpholine residue stream	No	TX.
Oxidate light ends	No	HCF.
Oxo process bottoms	No	CXI.
Propionic blends	No	HCL.
All other mixtures not specifically itemized	No	BAS, CGY, CXI, DUP, EKT, HCL, JSC, MON, NES, UCC, WAY.

[1] Chemicals for which separate statistics are reported in this section are indicated by 'Yes.' Chemicals for which data are accepted in confidence and may not be published are indicated by 'No.'
[2] The manufacturer did not consent to his identification with the designated products.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

Table 47

Miscellaneous cyclic and acyclic chemicals: Directory of manufacturers, alphabetical by code, 1988

Code	Name of company
AAC	Alcolac, Inc.
ABB	Abbott Laboratories
ACS	Allied Signal Inc., Engineered Material Sector
ACY	American Cyanamid Co.
ADC	Anderson Development Co.
AIP	Air Products & Chemicals, Inc.
ALD	Aldrich Chemical Co., Inc.
ALI	Anzon, Inc.
ALW	Albright & Wilson, Inc.
AMB	American Bio-Synthetics Corp.
AMO	Amoco Corp.
ANG	Angus Chemical Co.
ARC	Akzo Chemie America, Armak Chemicals
ARO	Arnco
ARS	Arsynco, Inc.
ART	Aristech Chemical Corp., Chemical Div.
ARZ	Arizona Chemical Co.
ASH	Ashland Oil, Inc.
ASL	Specialtychem Products Corp.
ATL	Atlantic Industries, Inc.
ATR	Atlantic Richfield Co., Arco Chemical Co.
AZT	Catalyst Resources, Inc.
BAS	BASF Corp.
BCC	Buffalo Color Corp.
BFG	B. F. Goodrich Co., B.F. Goodrich Chemical Group
BKC	J. T. Baker Chemical Co.
BKM	Buckman Laboratories, Inc.
BOC	Biocraft Laboratories, Inc.
BOR	Borden Inc., Borden Chemical Div.
BRD	Lonza, Inc.
BRI	Sedgefied Specialities
BTL	BTL Specialty Resin Corp.
BUC	Synalloy Corp., Blackman Uhler Chemical Div.
CAD	Akzo Chemie America, Noury Chemicals
CAS	Caschem, Inc.
CBD	Chembond Corp.
CCA	Akzo Chemicals, Inc
CCC	C.N.C. International Inc.
CCW	Morton-Thiokol, Inc., Carstab Div.
CGY	Ciba-Geigy Corp.
CHG	Mobay Chemical Corp., Agricultural Chemicals Div.
CHL	Chemol, Inc.
CHP	C. H. Patrick & Co., Inc.
CHT	Chattem, Inc.
CIN	Stockhausen, Inc.
CJO	C. J. Osborn, Div. of Suvar Corp.
CMB	Cambridge Industries Co.
CNE	Cain Chemical, Inc.
CNP	DSM Chemicals Augusta, Inc.
COC	Columbia Organic Chemicals Co., Inc.
COS	Cosan Chemical Corp.
CPS	CPS Chemical Co., Inc.
CRZ	James River Corp.
CWN	Upjohn Co., Fine Chemicals
CXI	Chemical Exchange Industries, Inc.
CYR	CYRO Industries
DAN	Dan River Inc., Chemical Products Div.
DAZ	Diaz Chemical Corp.
DCC	Dow Corning Corp.
DIX	Dixie Chemical Co., Inc.
DKA	Mobay Synthetics Corporation
DOM	Dominion Products, Inc.
DOW	Dow Chemical Co.
DPW	Deepwater, Inc.
DRC	Dock Resins Corp.
DRL	Unichema Chemicals, Inc.
DUP	E. I. duPont de Nemours & Co., Inc. AF/FP Dept. Chemicals & Pigments Dept. Petrochemicals Dept. Polymer Products Dept.
DVC	Dover Chemical Corp. Sub. of ICC Industries, Inc.
EFH	E. F. Houghton & Co.
EHC	Ethichem Corp.
EK	Eastman Kodak Co.:
EKT	Tennessee Eastman Co. Div.
EKX	Texas Eastman Co. Div.
ELC	Elco Corp. Sub. of Detrex Chemical Industries, Inc.
EMR	Quantum Chemical Corp., Emery Division
ENJ	Exxon Chemical Americas
ESA	East Shore Chemical Co.
EVN	W. R. Grace & Co., Organic Chemicals Div., Evans Chemetics
FER	Ferro Corp.: Ferro Chemical Div. Grant Chemical Div. Kell Chemical Div.
FMB	FMC Corp., Peroxygen Chemicals Div.
FMC	FMC Corp.
FMN	FMC Corp., Agricultural Chemical Group
FMT	Fairmount Chemical Co., Inc.
FOC	Handschy Industries, Inc., Farac Varnishes Chemicals
FOR	Formosa Plastics Corporation Louisiana
FRE	Freeman Chemical Corp.
FRO	Vulcan Materials Co., Chemicals Div.
FTE	Foote Mineral Co.
FTX	Finetex, Inc.
GAF	GAF Corp., Chemical Group
GAY	Gaylord Container
GE	General Electric Co.
GFS	G. Frederick Smith Chemical Co.

See footnotes at the end of table.

Table 47—Continued

Miscellaneous cyclic and acyclic chemicals: Directory of manufacturers, alphabetical by code, 1988

Code	*Name of company*
GGC	Georgia-Gulf Corp.: Plaquemine Div.
GGI	Grow Group, Inc.
GIV	Givaudan Corp.
GON	W.R. Grace & Co., Organic Chemicals Div. Nitroparaffins
GP	Georgia-Pacific Corp., Resins Operations
GPI	Grindsted Products, Inc.
GTL	Great Lakes Chemical Corp.
HAL	C. P. Hall Co.
HCC	Hatco Chemical Corp.
HCF	Cape Industries
HCL	Hoechst Celanese Corp: Chemical Group Inc. Fine Chemicals Division Sou-Tex Works
HCP	Honig Chemical & Processing Corp.
HDG	Hodag Chemical Corp.
HFT	Syntex Agribusiness, Inc., Nutrition & Chemical Div.
HK	Occidential Chemical Corp., & Specialty Chemical Div.
HML	Hummel Chemical Co.
HMP	W. R. Grace & Co., Hampshire Chemicals Div.
HMY	Humphrey Chemical Co.
HOC	Halocarbon Products Corp.
HPC	Hercules, Inc.
HRT	Hart Products Corp.
HTM	Haltermann Ltd. Co.
HXL	Hexcel Corp., Hexcel Chemical Products
ICI	ICI Americas, Inc.: Agricultural Chemical Div. Chemicals Div. Rubicon Inc.
IMC	IMC Pitman-Moore Industrial Chemicals Div.
JRC	Jarchem Industries, Inc.
JSC	Sybron Chemicals, Inc.
KCH	Joseph Ayers, Inc.
KLM	Kalama Chemical, Inc.
KMI	Kemin Industries, Inc.
LCP	LCP Chemicals - West Virginia, Inc.
LEM	Napp Chemicals, Inc.
LIL	Eli Lilly & Co.
LRO	Laroche Chemicals, Inc.
LYP	Lyondell Petrochemical Co.
MAL	Mallinckrodt, Inc.
MCB	Borg-Warner Corp., Borg-Warner Chemicals
MCI	Mooney Chemicals, Inc.
MCK	MacKenzie Chemical Works, Inc.
MHI	Morton-Thiokol, Inc., Ventron Div.
MIL	Milliken & Co., Milliken Chemical Div.
MLS	Miles Laboratories, Inc., Biotechnology Group
MNA	Monsanto Agricultural Co.
MOB	Mobay Chemical Corp., Pittsburgh Div.
MON	Monsanto Co.
MRF	Morflex Corp.
MRK	Merck & Co., Inc.
NCC	Niacet Corp.
NCI	Union Camp Corp., Terpene & Aromatics Div.
NCI	Union Camp Corp., Chemical Products Div.
NES	Ruetgers-Nease Chemical Co.
NOC	Norac Co., Inc. Mathe Div.
NOD	Huls America Inc.
OH	Anaquest
OMC	Olin Corp.
ORT	Roehr Chemicals, Inc., Div. of Aceto Corp.
PAC	Pacific Anchor Chemical Corp.
PAH	Parish Chemical Co.
PAS	Pennwalt Corp.
PCI	Piedmont Chemical Industries, Inc.
PD	Parke-Davis, Div. of Warner-Lambert Co.
PDG	P.D. Glycol
PEL	Pelron Corp.
PFN	Pfanstiehl Laboratories, Inc.
PFZ	Pfizer, Inc. and Pfizer Pharmaceuticals, Inc.
PG	Procter & Gamble Co., Procter & Gamble Mfg. Co.
PIC	Pierce Chemical Co.
PLC	Phillips 66 Co.
PLS	Plastics Engineering Co.
PMP	PMP Fermentation Products, Inc.
PPG	PPG Industries, Inc.
PSG	PMC Specialities Group, Inc.
PST	Perstorp Polyols, Inc.
QCP	Quaker Chemical Corp.
QKO	QO Chemicals, Inc.
RCI	Reichhold Chemicals, Inc.
RCN	Racon, Inc.
RDA	Rhone-Poulenc, Inc.
REG	Regis Chemical Co.
REM	Remington Arms Co., Inc.
REZ	Hi-Tek Polymers, Inc.
RH	Rohm & Haas Co.
RPC	Colloids, Inc.
RSA	R.S.A. Corp.
S	Sandoz, Inc.
SBC	Scher Chemicals, Inc.
SC	Sterling Chemicals, Inc.
SCM	SCM Glidco Organic
SCM	SCM Corp., PCR, Inc.
SCN	Schenectady Chemicals, Inc.
SCP	Henkel Corp.

See footnotes at the end of table.

Table 47—Continued
Miscellaneous cyclic and acyclic chemicals: Directory of manufacturers, alphabetical by code, 1988

Code	Name of company
SD	Sterling Drug, Inc.: Sterling Pharmaceuticals, Inc.
SDC	Sandoz Chemicals Corp.
SDW	Sterling Drug, Inc. Sterling Organics Div.
SHC	Shell Oil Co., Shell Chemical Co. Div.
SHP	Shepherd Chemical Co.
SHX	Sherex Chemical Co., Inc.
SK	SmithKline Chemical
SM	Mobil Oil Corp.: Chemical Products Div.
SOH	BP Chemicals America
SOI	Specialty Organics, Inc.
SOM	Southland Corp.
SPD	General Electric Co., Silicone Products Dept.
SQA	Sequa Chemicals, Inc.
SUN	Sun Co., Inc.
SWS	Wacker Silicones
SYL	Arizona Chemical Co.
SYP	Synthetic Products Co., Division of Plastic Specialties & Technology, Inc.
TCC	Sybron Chemicals, Inc.
TCH	Quantum Chemical Corp.
TLC	Twin Lake Chemical, Inc.
TLI	Teledyne Industries, Inc., Teledyne McCormick Selph
TMH	Hacros Chemicals, Inc.
TNA	Ethyl Corp.
TNI	Gillette Co., Chemical Div.
TRC	Trimont Chemicals, Inc.
TRO	Troy Chemical Corp.
TSA	Texas Alkyls, Inc.
TU	Tenn-USS Chemicals Co.
TX	Texaco, Inc., Texaco Chemical Co.
TZC	Magnesium Elektron, Inc.
UCC	Union Carbide Corp.
UPM	UOP, Inc.
USB	U. S. Borax & Chemical Corp., U.S. Borax Research Corp.
USI	Quantum Chemical Corp., USI Div.
USR	Uniroyal, Inc., Uniroyal Chemical Div.
UTC	Unitex Chemical Corp.
VCM	Vanchem, Inc.
VDM	Van De Mark Chemical Co., Inc.
VEL	Velsicol Chemical Corp.
VIK	Viking Chemical Co.
VNC	Vanderbilt Chemical Corp.
VND	Van Dyk, Div. of Mallinckrodt, Inc.
VST	Vista Chemical Co.
WAY	Olin Hunt Specialty Products, Inc.
WCC	White Chemical Corp.
WCL	Wright Chemical Corp.
WLN	Wilmington Chemical Corp.
WM	Inolex Chemical Co.
WPG	West Point-Pepperell, Inc., Grifftex Chemical Co. Sub.
WTC	Witco Chemical Corp.
WTH	Union Camp Corp.
WTK	Whittaker Corp., Helco Chemicals Div.
WTL	Pennwalt Corp., Lucidol Div.
WVA	Westvaco Corp.,

Note.—Complete names, telephone numbers, and addresses of the above reporting companies are listed in app. A.
Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

APPENDIX A
DIRECTORY OF MANUFACTURERS

Table A-1

Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1988

(Names of synthetic organic chemicals manufacturers that reported production and/or sales to the U.S. International Trade Commission for 1988 are listed below alphabetically, together with their identification codes as used in each of the 15 individual sections of this report)

Identification Code	*Name of company*	*Telephone number*	*Office address*
AEP	A & E Plastic Inc	818-968-3801	14505 Proctor Ave. Industry, CA 91749.
ABB	Abbott Laboratories	312-937-3452	1401 Sheridan Rd., N. Chicago, IL 60064.
ILI	Acme Steel Company	312-849-2500	13500 S. Perry Avenue Riverdale, IL. 60627.
ACO	Adco Chemical Co	201-589-0880	129 Rutherford St., Newark, NJ 07105.
AIP	Air Products & Chemicals, Inc	215-481-4911	7201 Hamilton Blvd, Allentown, PA 18195-1501.
AJY	Ajay Chemicals, Inc	404-943-6202	1400 Industry Rd., Powder Springs, GA 30073.
AJI	Ajinomoto U.S.A., Inc	201-488-1212	4020 Ajinomoto Dr., Raleigh, NC 27610.
CCA	Akzo Chemical, Inc	201-247-2202	500 Jersey Ave, New Brunswick, NJ 08903
ARC	Akzo Chemical Inc., Armak Chemicals	312-906-7500	300 S. Riverside, Plaza Chicago, IL 60606.
CAD	Akzo Chemie America, Noury Chemicals	716-778-8554	2153 Lockport-Olcott Rd., Burt, NY 14028
FRP	Akzo Coating Inc	912-367-3616	P.O. Box 3219 Baxley Georgia 31513.
ALW	Albright & Wilson, Americas Inc	804-752-6100	P. O. Box 26229, Richmond, VA 23260.
ALC	Alco Chemical Corp	615-629-1405	P.O. Box 5401, Chattanooga, TN 37406.
AAC	Alcolac, Inc	301-859-4900	1099 Winterson Rd., Baltimore, MD 21226.
ALD	Aldrich Chemical Co., Inc	414-273-3850	940 W. St. Paul Ave., Milwaukee, WI 53233.
ALE	Alex Chemical Co	717-462-3500	119 N. Union St., Shenandoah, PA 17976.
ACH	Allco Chemical Corp	316-783-1321	P.O. Box 247, Galena, KS 66739.
ALG	Allegheny Chemical Corp	814-772-3965	Gillis Ave., Ridgway, PA 15853.
ALL	Alliance Chemical, Inc	201-945-5400	Linden Ave., Ridgefield, NJ 07657.
BME	Allied Signal-Bendix, Friction Materials Div.	518-270-0200	P. O. Box 238 Troy, NY 12180.
ACS	Allied Signal Inc	201-455-4312	Columbia Rd. & Park Ave., Morristown, NJ 07960.
	Engineered Plastic Div.		
ACS	Allied-Signal, Inc	504-775-4330	12875 Scenic Hwy, Baton Rouge, LA 70892-3006.
	High Density Polyethylene Business Engineered Materials Sector	201-455-4911	P.O. Box 1051 R, Morristown, NJ 07054
ALX	Alox Corp	716-282-1295	3943 Buffalo Ave., Niagara Falls, NY 14303.
APH	Alpha Corporation of Tennessee	901-853-2450	423 Highway 57 East, Collierville, TN 38017.
ALP	Alpha Laboratories, Inc	303-756-1338	P. O. Box 22223, Denver, CO 80222.
HES	Amerada Hess Corp. (Hess Oil Virgin	201-750-6000	1 Hess Plaza, Woodbridge, NJ 07095-0961.
AMB	American Bio-Synthetics Corp	414-384-7017	710 W. National Ave., Milwaukee, WI 53204.
ACY	American Cyanamid Co	201-831-2768	One Cyanamid Plaza, Wayne, NJ 07470.
AMU	American Emulsions, Inc	404-226-7028	1202 Dozier St., Dalton, GA 30721.
API	American Polymers, Inc	617-987-0144	Old Webster Rd., Oxford, MA 01540.
ASY	American Synthetic Rubber Corp	502-449-8300	P. O. Box 32960, Louisville, KY 40232.
SPO	Ameripol Synpol Co. Div. of Uniroyal Goodrich Tire Co	216-762-4442	146 South High St. Akron, OH 44308-1493.
HVG	Ametek, Inc., Haveg Div	302-995-0400	900 Greenbank Rd., Wilmington, DE 19808.
AMO	Amoco Corporation	312-856-6111	P. O. Box 87703 Mail Code 1201, Chicago, IL 60680-0703.
AMV	Amvac Chemical Corp	213-264-3910	4100 E. Washington Blvd., Los Angeles, CA 90023.
OH	Anaquest	608-273-0019	2005 W. Beltline Hwy., Madison, WI 53713.
ADC	Anderson Development Co	517-263-2121	1415 E. Michigan St., Adrian, MI 49221.
ANG	Angus Chemical Co	312-498-6700	2211 Sanders Rd., Northbrook, IL 60062.

Table A-1—Continued

Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1988

(Names of synthetic organic chemicals manufacturers that reported production and/or sales to the U.S. International Trade Commission for 1988 are listed below alphabetically, together with their identification codes as used in each of the 15 individual sections of this report)

Identification Code	*Name of company*	*Telephone number*	*Office address*
ALI	Anzon, Inc	215-427-3000	2545 Aramingo Ave., Philadelphia, PA 19125.
APX	Apex Chemical Co	201-354-5420	200 S. First St., Elizabeth, NJ
APC	Apollo Chemical Corp	919-226-1161	1105 Southerland St., Graham, NC 27253.
APO	Apollo Colors, Inc	312-564-9190	3000 Dundee Suite 415, Northbrook, IL 60062.
AQU	Aqualon Co	302-996-2030	2711 Centerville Rd., Wilmington, DE 19850-5417.
ARD	Ardmore Inc	201-481-2406	29 Riverside Ave., Newark, NJ 07104.
ART	Aristech Chemical Corp.:		
	Chemical Div	412-433-2747	600 Grant St., Pittsburgh, PA 15230-0250.
ARN	Arenol Chemical Corp	201-526-5900	189 Meister Ave., Somerville, NJ 08876
ARZ	Arizona Chemical Co	904-785-6700	1001 E. Business Hwy, 98, Panama City, FL 32401 , and P.O. Box 947 Port St. Joe, FL. 32456.
ALS	Armco, Inc., Eastern Steel Div	513-425-2744	703 Curtis St., Middletown, OH 45043.
ARP	Armour Pharmaceutical Co	815-932-6771	P. O. Box 511, Kankakee, IL 60901.
ARK	Armstrong World Industries, Inc	717-397-0611	3331 Liberty Street, Lancaster, PA 17604.
ARO	ARNCO	714-739-7900	One Centerpointe Dr., LaPalma, CA 90623-1094.
ARL	Arol Chemical Products Co	201-344-1510	649 Ferry St., Newark, NJ 07105.
ARS	Arsynco, Inc., Sub Div. of Aceto Corp	718-898-2300	126-02 Northern Blvd., Flushing, NY 11368.
ASH	Ashland Oil, Inc	614-889-3333	P. O. Box 2219, Columbus, OH 43216.
	Ashland Petroleum Co	606-329-3333	P. O. Box 391, Ashland, KY 41114.
BLA	Astor Products, Inc., Blue Arrow Div	904-783-5000	5244 Edgewood Ct., Jacksonville, FL 32205.
ATL	Atlantic Industries, Inc	201-235-1800	10 Kingsland Rd., Nutley, NJ 07110.
ATR	Atlantic Richfield Co., Arco Chemical Co	215-359-2000	3801 Westchester Pike. Newtown Square, PA 19073.
APD	Atlas Powder Co., sub. of Tyler Corp	214-387-2400	P. O. Box 87, Joplin, MO 64802.
ARI	Atlas Refinery, Inc	201-589-2002	142 Lockwood St., Newark, NJ 07105.
RSN	Atochem Inc. Polymers Div	201-447-3300	266 Harristown Rd. Glen Rock, N.J. 07452.
AUX	Auralux Corp	203-886-2616	29 Scott Ave., Norwich, CT 06360.
AUS	Ausimont N.V	617-736-1400	128 Technology Drive, Waltham, MA 02254.
SOH	BP Chemical Inc	216-586-4141	200 Public Square 31-4105-N Cleveland, OH 44114 - 2375.
	BP America:		
SIF	Filon Div	213-757-5141	12333 South Van Ness Ave., Hawthorne, CA 90250.
SIC	Silmar Div	213-757-1801	12333 South Van Ness Ave., Hawthorne, CA 90250.
CO			
SIO	BP Oil Company	419-226-2300	1150 South Metcalf Street, Lima, OH 45804.
BAS	BASF Corp.		
	Chemicals Div	201-316-2937	100 Cherry Hill Rd., Parsippany, NJ 07054.
ICF	Coating & Colorants	201-365-3400	1255 Broad St., Clifton, NJ 07015.
BTL	BTL Speciality Resin Corp	419-244-5856	2112 Sylvon Ave., Toledo, Oh. 43606.
BKC	J. T. Baker Chemical Co	201-859-2151	222 Red School Lane, Phillipsburg, NJ 08865.

Table A-1—Continued

Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1988

(Names of synthetic organic chemicals manufacturers that reported production and/or sales to the U.S. International Trade Commission for 1988 are listed below alphabetically, together with their identification codes as used in each of the 15 individual sections of this report)

Identification Code	Name of company	Telephone number	Office address
KPT	Beazer Materials & Services, Inc	412-227-2000	Koppers Bldg. 436 7th Ave., Pittsburgh Pa. 15219.
BCK	Beckman Instruments, Inc	619-993-8740	2470 Faraday Ave. Carlsbad, CA 92008.
	Diagnostic Systems Group		
BIB	Spinco Div	714-871-4848	1050 Page Mill Rd., Palo Alto, CA 94304.
	Beecham, Inc.:		
BEE	Beecham Laboratories.Div	201-469-5200	101 Possumtown Rd., Piscataway, NJ 08854.
BEW	Beecham Western Hemisphere, Inc	201-881-3000	3 Garret Mountain Plaza, West Paterson, NJ 07424.
BCM	Belding Chemical Industries	212-944-6040	P.O. Box 130 Hendersonville , NC 28793
BLZ	Belzak Corp	201-773-0602	850 Bloomfield Ave., Clifton, NJ 07012.
BTS	Bethlehem Steel Corp	215-694-4522	866 Martin Tower - 8th Fl., Bethlehem, PA 18016.
BOC	Biocraft Laboratories, Inc	201-796-3434	12 Industrial Park, Waldwick, NJ 07463.
BNP	Bison Nitrogen Products Co	712-277-1340	Terra Centre, 600 4th St., Sioux City, IA 51101.
BOE	Boehme Filatex, Inc	919-342-1051	Rt. 11 Box 5 Reidsville, N.C. 27320.
BOT	Boots Co. (USA) Inc	312-405-7400	300 Tristate Int'l Ctr. Suite 200 Lincolnshire, IL 60015.
BOR	Borden, Inc.:		
	Borden Chemical Div	614-225-4000	180 E. Broad St., Columbus. OH 43215.
MCB	Borg-Warner Corp., Borg-Warner Chemicals	304-424-5411	International Center, Parkersburg, WV 26101.
BFP	Breddo Inc	913-321-5300	18th & Kansas Ave., Kansas City, KS 66105.
BMC	Brin-Mont Chemicals, Inc	919-292-0566	3921 Spring Garden St., Greensboro, NC 27407.
BRS	Bristol-Myers Co	212-546-4000	345 Park Ave., New York, NY 10154.
BRU	M. A. Bruder & Sons, Inc	215-353-5100	52nd & Grays Ave., Philadelphia, PA 19143.
BKM	Buckman Laboratories, Inc	901-278-0330	1256 N. McLean Blvd., Memphis, TN 38122.
BCC	Buffalo Color Corp	716-827-4500	P.O. Box 7027., Buffalo, NY 14210.
BRR	Burris Chemical, Inc., Color Div	803-277-8977	175 Eschelon Rd., Greenville, SC 29605.
BUR	Burroughs Wellcome Co	919-248-3000	3030 Cornwallis Rd., Research Triangle Park, NC 27709.
CFI	CF Industries, Inc	312-438-9500	Salem Lake Dr., Long Grove, IL 60047.
CLU	CL Industries, Inc	217-662-2136	P. O. Box 218 Georgetown, IL 61846.
CCC	C.N.C. International, Inc	401-769-6100	20 Priviledge St., Woonsocket, RI 02895.
	CPC International, Inc.:		
ACR	Acme Resin Corp	312-343-1900	10330 W. Roosevelt Rd. Westchester, IL 60153.
CPS	CPS Chemical Co., Inc	201-727-3100	P. O. Box 162, Old Bridge, NJ 08857.
CYR	CYRO Industries	201-930-2000	100 Valley Rd., Mr. Arlington, NJ 07856.
CNE	Cain Chemical, Inc	713-623-2246	5 Greenway Plaza, Houston, TX 77046.
GRL	Calgon Corp., Calgon Vestal Laboratories Div.	314-862-2000	5035 Manchester Ave., St. Louis, MO 63110.
CMB	Cambridge Industries Co	617-924-0026	440 Arsenal St., Watertown, MA 02172.
HCF	Cape Industries	919-341-5500	P. O. Box 327 Wilmington, NC 28402.
SVC	Capital City Products Co	608-752-9007	1530 S. Jackson St., Janesville, WI 53545.
CBC	Carbose Corp	814-443-1611	100 Maple St., Somerset, PA 15501.
CGL	Cargill, Inc	612-475-7646	P. O. Box 5630, Minneapolis, MN 55428.
CDT	Carondelet Coke Corp	314-638-2400	526 E. Catalan Street St. Louis, MO. 63111.
CHC	Carpenter Chemical Co	804-359-0800	P. O. Box 27205, Richmond, VA 23261.
BSC	Cascade Resins, Inc	503-343-2111	P. O. Box 1989, Eugene, OR 97440.
CAS	Caschem, Inc	201-858-7900	40 Avenue A, Bayonne, NJ 07002.

Table A-1—Continued

Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1988

(Names of synthetic organic chemicals manufacturers that reported production and/or sales to the U.S. International Trade Commission for 1988 are listed below alphabetically, together with their identification codes as used in each of the 15 individual sections of this report)

Identification Code	*Name of company*	*Telephone number*	*Office address*
AZT	Catalyst Resources, Inc	713-957-6813	2190 North Loop West, Suite 400, Houston, TX 77018.
CCL	Catawba-Charlab, Inc	704-523-4242	5046 Old Pineville Rd., Charlotte, NC 28217.
CED	Cedar Chemical Co	901-685-5348	P.O. Box 3 Vicksburg, MS 39180
CED	Cedar Chemical Co	501-572-3701	Highway 242 South, West Helena, AR 72390.
		901-685-5348	and P. O. Box 3, Vicksburg, MS 39180.
CNT	Certainteed Corp	215-341-7000	P. O. Box 860, Valley Forge, PA 19482.
CPR	Certified Processing Corp	201-923-5200	U.S. Highway #22, Hillside, NJ 07205.
GRS	Champlin Refining. Co	512-882-8871	P. O. Box 9176, Corpus Christi, TX 78469.
CHH	Chr. Hansen's Laboratory, Inc	414-476-3630	9015 W. Maple St., West Allis, WI 53214.
CHT	Chattem, Inc	615-821-4571	1715 W. 38th St., Chattanooga, TN 37409.
CBD	Chembond Corp	503-687-8840	1600 Valley River Dr., Suite 390, Eugene, OR 97401.
CFX	Chemfax, Inc	601-863-6511	10045 Three River Rd., Gulfport, MS 39503.
CXI	Chemical Exchange Industries, Inc	713-526-8291	3813 Buffalo Speedway, Houston, TX 77098.
CMT	Chemithon Corp	206-937-9954	5430 W. Marginal Way, SW., Seattle, WA 98106.
CHL	Chemol Co	919-272-3121	2410 Randolph Ave., Greensboro, NC 27406.
CRT	Chemos Corp	201-966-0044	225-235 Emmet St., Newark, NJ 07114.
SOC	Chevron Corp., Chevron Chemical Co	415-842-5500	6001 Bollinger Canyon Rd., San Ramon, 94583.
CMC	Chromatic Color Corp	502-737-1700	305 Ring Rd., Elizabethtown KY, 42701.
CGY	Ciba-Geigy Corp	914-478-3131	444 Saw Mill River Rd., Ardsley, NY 10502.
FJI	Cincinnati Varnish Co	513-631-4270	1776 Mentor Ave., Cincinnati, OH 45212.
CGO	Citgo Petroleum Corp	918-495-4000	P. O. Box 1562, Lake Charles, LA 70602.
CGU	Citizens Gas & Coke Utility	317-631-2181	3133 Southeastern Ave., Indianpolis, IN 46203.
ACT	Climax Performance Materials Corp	214-333-2151	7666 W. 63rd St. Summit, IL 60501
CSP	Coastal Refining & Marketing Inc	713-877-1400	Nine Greenway Plaza, Houston, TX 77046.
CP	Colgate-Palmolive Co.	212-310-2000	300 Park Ave., New York, NY 10022.
RPC	Colloids Lyndal Div	404-259-4831	1338 Coronet Drive Dalton, Ga. 30720.
CLD	Colloids, Inc	201-926-6100	P.O. Box 769, Marietta, GA 30061.
CIC	Color Chem International Corp	201-444-8563	7 Plymouth Rd., Glen Rock, NJ 07452.
CCS	Colorado Chemical Specialties, Inc	303-245-8148	569 24-1/4 Rd., Grand Junction, CO 81505.
CRS	Colorado Resins, Inc	303-245-8148	569 24-1/4 Rd., Grand Junction, CO 81505.
CNC	Columbia Nitrogen Corp	404-823-4300	P.O. Box 1483, Augusta, GA 30903.
COC	Columbia Organic Chemical Co., Inc	803-425-1786	1424 Mt. Zion Road, Cassatt SC 29032.
CAC	Cominco Fertilizers Inc	509-747-6111	W. 818 Riverside Ave., Spokane, WA 99201.
CMP	Commercial Products Co., Inc	201-427-6887	117 Ethel Ave., Hawthorne, NJ 07506.
CNI	Conap, Inc	716-372-9650	1405 Buffalo St., Olean, NY 14760.
CON	Concord Chemical Co., Inc	609-966-1526	17th & Federal Sts., Camden, NJ 08105.
CO	Conoco Specialty Products, Inc	713-293-1764	600 N. Dairy Ashford Rd. Houston, TX 77079.
OTL	Continental Chemical Co	201-472-5000	270 Clifton Blvd. Clifton, NJ 07011-3686
CTP	Continental Polymers, Inc	213-637-2103	2225 E. Del Amo Blvd., Compton, CA 90220.
CPV	Cook Paint & Varnish Co	816-391-6000	P. O. Box 419389, Kansas City, MO 64141.

Table A-1—Continued

Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1988

(Names of synthetic organic chemicals manufacturers that reported production and/or sales to the U.S. International Trade Commission for 1988 are listed below alphabetically, together with their identification codes as used in each of the 15 individual sections of this report)

Identification Code	Name of company	Telephone number	Office address
COP	Coopers Creek Chemical Corp	215-828-0375	River Rd., West Conshohocken, PA 19428.
CPY	Copolymer Rubber & Chemical Corp	504-355-5655	P. O. Box 2591, Baton Rouge, LA 70821.
COS	Cosan Chemical Corp	201-460-9300	400 - 14th St., Carlstadt, NJ 07072.
CMS	Cosmic Plastics, Inc	818-365-3249	12314 Gladstone Ave., San Francisco, CA 91342.
CRD	Croda, Inc	212-683-3089	183 Madison Ave., New York, NY 10016.
CK	Crompton & Knowles Corp	215-775-8000	P. O. Box 341, Reading, PA 19603.
CCP	Crown Central Petroleum Corp	301-539-7400	1 N. Charles St., Baltimore, MD 21203.
USM	Crown Metro, Inc	803-299-1331	Echelon Road, Donaldson Centre, Greenville, SC 29606.
CYT	Cumberland International Corp	713-682-1221	1523 N. Post Oak Rd., Houston, TX 77055.
CTR	Customs Resins Div. of Bemis Co., Inc	502-826-7641	Highway 136 West, Henderson, KY 42420.
AMD	Cyclo Products, Inc	213-582-6411	1922 E. 64th St., Los Angeles, CA 90001.
CNP	DSM Chemicals Augusta, Inc	404-823-4240	P. O. Box 2451, Augusta, GA 30903.
POP	Daicolor Pope, Inc	201-279-2702	33 Sixth Ave Paterson, NJ 07524.
MAR	Daishowa Chemical Inc	203-625-0701	81 Holly Hill Lane Greenwich, CT 06830.
DAN	Dan River, Inc., Chemical Products Div	804-799-7000	P. O. Box 261, Danville, VA 24543.
DPI	Dart Polymers, Inc., Sub. of Dart Container Corp.	517-676-3800	432 Hogsback Rd., Mason, MI 48854.
DGO	Day-Glo Color Corp	216-391-7070	4515 St. Clair Ave., Cleveland, OH 44103.
DPW	Deepwater, Inc	714-751-3522	P. O. Box 17599, Irvine, CA 92713.
DGC	Degussa Corp	201-641-6100	65 Chassenger Rd., Ridgefield Park, NJ 07660.
DRR	Delta Resins & Refractories, Inc	414-462-1200	6263 N. Teutonia Ave., Milwaukee, WI 53209.
DNS	Dennis Chemical Co	314-771-1800	2700 Papin St., St. Louis, MO 63103.
DRB	Derby Co., Inc	508-342-5831	119 Authority Dr., Fitchburg, MA 01420.
DSO & PLX	DeSoto, Inc	312-391-9000	1700 S. Mt. Prospect Rd., Des Plaines, IL 60018.
UDI	DeSoto, Inc	312-391-9000	1220 N. Main Place, Fort Worth, TX 76106.
DTR	Detroit Coke Corp	312-842-6222	7819 West Jefferson Ave., Detroit, MI. 48209.
DEX	Dexter Chemical Corp	212-542-7700	845 Edgewater Rd., Bronx, NY 10474.
HYA	Dexter Corp, Dexter Adhesives Structual Materials Div.	415-687-4201	2850 Willow Pass Road, Pittsburgh, CA. 94565.
HYC	Dexter Corp., Dexter Electronic Material Div.	818-968-6511	15051 E. Don Julian Rd., Industry, CA 91749.
MID	Midland Div	312-623-4200	E. Water St., Waukegan, IL 60085.
AGP	Dial Corp	602-248-2800	2000 Aucutt Rd., Montgomery, AL 60538.
DA	Diamond Shamrock Refining & Marketing	512-641-6800	P. O. Box 696000, San Antonio, TX 78269-6000.
DAZ	Diaz Chemical Corp	716-638-6321	40 Jackson St., Holley, NY 14470.
PLN	Disogrin Industries Corp	603-669-4050	Grenier Industrial Airpark, Manchester, NH 03103.
DIX	Dixie Chemical Co., Inc	713-526-2604	3635 W. Dallas Ave., Houston, TX 77019.
DRC	Dock Resins Corp	201-862-2351	1512 W. Elizabeth Ave., Linden, NJ 07036.
DOM	Dominion Products, Inc	718-499-3050	882 - 3rd Ave., Brooklyn, NY 11232.
DVC	Dover Chemical Corp. Sub. of ICC	216-343-7711	W. 15th & Davis Sts., Dover, OH 44622.
DOW	Dow Chemical Co	517-636-6125	2020 Willard H. Dow Center, Midland, MI 48674.
DCC	Dow Corning Corp	517-496-4000	P.O. Box 994, Midland, MI 48686-0994.

Table A-1—Continued

Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1988

(Names of synthetic organic chemicals manufacturers that reported production and/or sales to the U.S. International Trade Commission for 1988 are listed below alphabetically, together with their identification codes as used in each of the 15 individual sections of this report)

Identification Code	*Name of company*	*Telephone number*	*Office address*
ABP	Drummond Company, Inc	205-945-6301	P. O. Box 10246, Birmingham, AL 35209.
WBG	Dryden Oil Co White & Bagley Div	617-791-3201	688-692-Millburyst, Worchester, Ma. 01607
CHO	Ducon	618-654-2070	P. O. Box 219, Highland, IL 62249.
DUP	E. I. duPont de Nemours & Co., Inc	302-774-1000	1007 Market St., Wilmington, DE 19898.
DSC	Dye Specialties, Inc	201-866-9504	100 Plaza Center, Secaucus, NJ 07096.
AGI	EMS-American Grilon, Inc	803-481-9173	P. O. Box 1948, Sumter, SC 29151.
ECC	Eastern Color & Chemical Co	401-331-9000	35 Livingston St., Providence, RI 02904.
EK	Eastman Kodak Co	716-724-4000	343 State St., Rochester, NY 14650.
EKT	Tennessee Eastman Co. Div	615-229-2000	P. O. Box 1974, Kingsport, TN 37662.
EKX	Texas Eastman Co. Div	214-236-5012	P. O. Box 7444, Kingsport, TN 37662.
ESA	East Shore Chemical Co,	616-726-3106	1221 E. Barney Ave., Muskegon, MI 49443.
ELN	Elan Chemical Co	201-344-8014	268 Doremus Ave., Newark, NJ 07105.
ELC	Elco Corp. Sub. of Detrex Chemical Industries, Inc.	216-749-2605	1000 Beltline Rd. Cleveland OH 44109.
USM	Emhart Corp., Bostik Div	617-777-0100	Boston St., Middleton, MA 01949.
EMK	Emkay Chemical Co	201-352-7053	319-315 Second ST P.O. Box 42, Elizabeth, NJ 07206
EKO	Empire Coke Co	205-323-2400	1927 1st Ave., N., Birmingham, AL 35203.
ENO	Enenco, Inc	901-320-5800	755 Crossover Lane, Memphis, TN 38117.
HSH	Engelhard Corp	201-632-6000	3400 Band Street, Louisville, KY 40212.
SAR	Esschem, Inc	215-521-3800	P. O. Box 56, Essington, PA 19029.
ESS	Essential Industries, Inc	414-691-3000	28391 Essential Rd., Merton, WI 53056.
EHC	Ethichem Corp	201-933-7880	150 Grand St., Carlstadt, NJ 07072.
ETC	Ethox Chemicals, Inc.	803-277-1620	P.O. Box 5094, Station B, Greenville, SC 29606.
TNA	Ethyl Corp	804-788-5000	330 S. 4th St., Richmond, VA 23217.
AVA	Eval Co. Of America	312-719-4610	1001 Warrenville Rd., Lisle, IL 60532.
ENJ	Exxon Chemical Americas	713-870-6000	P.O. Box 3272, Houston, TX 77253-3272.
FMC	FMC Corp	215-299-6000	2000 Market St., Philadelphia, PA 19103.
FMN	Agricultural Chemical Group	215-299-6000	2000 Market St., Philadelphia, PA 19103.
FMB	Peroxygen Chemicals Div	716-876-8300	Sawyer Ave. & River Rd., Town of Tonawanda, NY 14150.
FAB	Fabricolor Manufacturing Corp	201-742-3900	P.O. Box 2398, Paterson, NJ 07509.
FMT	Fairmount Chemical Co., Inc	201-344-5790	117 Blanchard St., Newark, NJ 07105.
FRI	Farmland Industries, Inc	816-459-6000	P.O. Box 308, Lawrence KS 66044.
	Farmland Industries, Inc	816-238-8111	1417 Lower Lake Rd., St. Joseph, Mo 64502.
FEL	Felton World Wide, Inc	718-497-4664	599 Johnson Ave., Brooklyn, NY 11237.
SDS	Fermenta Plant Protection	216-357-4100	5966 Heisley Rd., Mentor, OH 44061-8000.
FER	Ferro Corp		
	Bedford Chemical Div	216-641-8580	7050 Krick Rd., Bedford, OH 44146.
	Grant Chemical Div	504-654-6801	P. O. Box 263, Baton Rouge, LA 70770.
	Keil Chemical Div	219-931-2630	3000 Sheffield Ave., Hammond, IN 46320.
FBI	Fiber Industries, Inc	704-357-2000	5146 Parkway Plaza Blvd., Charlotte, NC. 28217.
CSD	Fina Oil & Chemical Co., Cosden Chemical Div	214-750-2400	8350 N. Central, Dallas, TX 75206.
FTX	Finetex, Inc	201-797-4686	418 Falmouth Ave., Elmwood Park, NJ 07407.
	Firestone Tire & Rubber Co.:		
FRF	Firestone Fibers & Textile Co	216-379-7000	P. O. Box 450, Hopewell, VA 23860.
FRS	Firestone Synthetic Rubber & Latex Co. Div.	216-379-7495	P.O. Box 26611, Akron, OH 44319-0006.
CI	Firmenich, Inc	609-452-1000	P.O. Box 5880, Princeton, NJ 08543.

Table A-1—Continued

Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1988

(Names of synthetic organic chemicals manufacturers that reported production and/or sales to the U.S. International Trade Commission for 1988 are listed below alphabetically, together with their identification codes as used in each of the 15 individual sections of this report)

Identification Code	Name of company	Telephone number	Office address
FST	First Chemical Corp	601-762-0870	P. O. Box 1427, Pascagoula, MS 39567.
FPC	Flambeau Paper Corp	715-762-3231	200 N. First Ave., Park Falls, WI 54552.
FLM	Fleming Laboratories, Inc	704-372-5613	2215 Thrift Rd., Charlotte, NC 28234.
CIK	Flint Ink Corp., Cal/Ink Div	415-525-1188	1404 - 4th St., Berkeley, CA 94710.
EEP	Fluorocarbon Co	216-274-3171	Main & Orchard Sts. Mantua, OH 44255.
FTE	Foote Mineral Co	215-889-9605	301 Lindenwood Drive Suite 301, Malvern Pa. 19355.
FOR	Formosa Plastics Corp-Louisiana	504-356-3341	P. O. Box 271, Baton Rouge, LA 70821.
	Formosa Plastics Corp-USA	201-966-6980	66 Hanover Rd., Florham Park, NJ 07932.
BDS	Fragrance Resource, Inc	201-264-6767	275 Clark Street Keyport, NJ 07735.
FLN	Franklin International	614-443-0241	2020 Bruck St., Columbus, OH 43207.
FRE	Freeman Chemical Corp	414-284-5541	217 Freeman Dr. Port Washington, WI 53074.
WLC	Freeport McMoran Resource Partners	504-582-4000	1615 Poydras St. New Orleans, LA 70112.
FB	Fritzsche Dodge & Olcott, Inc	212-929-4100	76 - 9th Ave., New York, NY 10011.
FLH	H.B. Fuller Co	612-645-3401	3530 North Lexington Ave., St. Paul, MN 55126.
COO	H.B. Fuller Co	617-658-3351	820 Woburn St. Wilmington, MA 01887.
GAF	GAF Chemical Corp	201-628-3000	P. O. Box 12, Linden, NJ 07036.
GLX	Galaxie Chemical Corp	201-279-0558	26 Piercy St., Paterson, NJ 07524.
GAN	Ganes Chemicals, Inc	201-507-4300	630 Broad St., Carlstadt, NJ 07072.
GAY	Gaylord Chemical Corp	206-254-0922	P.O. Box 1209, Slidell, LA 70459-1209.
GNT	Gencorp Polymers Products	216-869-4200	165 S. Cleveland Ave. Mogadore, OH 44260.
GNR	Genencor, Inc	415-742-7500	180 Kimball Way, S. San Francisco, CA 94080.
GE	General Electric Co.:		
	Electromaterials	614-622-5310	1350 S. Second St., Coshocton, OH 43812.
	Plastics Business Group	413-448-6394	1 Plastics Ave., Pittsfield, MA 01201.
GEP	Plastics Div	413-448-7110	1 Plastics Ave., Pittsfield, MA 01201.
SPD	Silicone Products Div	518-237-3330	Mechanicville Road, Waterford, NY 12188.
GNF	General Foods Manufacturing Corp., Maxwell House Coffee Co	201-420-3432	1125 Hudson St., Hoboken, NJ 07030.
GLC	General Latex and Chemical Corp	617-576-8000	P.O. Box 498, Ashland, OH 44805.
GRG	P.D. George Co	314-621-5700	5200 N. Second St., St. Louis, MO 63147.
GGC	Georgia Gulf Corp:		
	Houston Div	404-395-4549	400 Perimeter Ctr., Terr. Suite 595, Atlanta, GA 30346.
	Plaquemine Div	404-395-4500	400 Perimeter Center Terrace, Suite 595, Atlanta, GA 30348.
	PVC Compound Div	404-395-4500	P.O. Box 629 Plaquemine, LA 70765-0629.
	Georgia-Pacific Corp.:		
PSP	Bellingham Div	206-733-4410	P. O. Box 1236, Bellingham, WA 98227.
GP	Resins Inc	404-521-4000	133 Peachtree St. NE., Atlanta, GA 30303.
TNI	Gillette Chemical Co	617-421-7000	3500 W. 16th St., N. Chicago, IL 60064.
GIV	Givaudan Corp	201-365-8000	100 Delawanna Ave., Clifton, NJ 07014.
GLD	Glidden Company	216-344-8000	925 Euclid Ave., Cleveland OH 44115.
BFG	B. F. Goodrich Co	216-447-7802	6100 Oak Tree Blvd., Cleveland, OH 44131.
HGC	Goodson Polymers, Inc	801-272-9000	1250 South Union St., Troy, OH 45373.
GYR	Goodyear Tire & Rubber Co	216-796-2121	1144 E. Market St., Akron, OH 44316.
	W. R. Grace & Co.:		
HMP	Hampshire Chemicals Div	617-861-6600	55 Hayden Ave., Lexington, MA 02173.
EVN	Organic Chemicals Div., Evans Chemetics	617-861-6600	55 Hayden Ave., Lexington, MA 02173.

Table A-1—Continued

Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1988

(Names of synthetic organic chemicals manufacturers that reported production and/or sales to the U.S. International Trade Commission for 1988 are listed below alphabetically, together with their identification codes as used in each of the 15 individual sections of this report)

Identification Code	*Name of company*	*Telephone number*	*Office address*
	W. R. Grace & Co.:—*Continued:*		
CON	Organic Chemical Div. Nitroparafins	617-861-6600	55 Hayden Avenue., Lexington, MA 02173.
GRD	Organic Chemicals & Polymers Div	617-861-6600	55 Hayden Ave., Lexington, MA 02173.
GPC	Grain Processing Corp	319-264-4211	1600 Oregon Street, Muscatine, IA 52761-0349.
CPC	Grant Industries, Inc	201-791-6700	P. O. Box 360, Elmwood Park, NJ 07407.
GTL	Great Lakes Chemical Corp	317-497-6100	P.O. Box 2200, W. Lafayette, IN 47906.
GNW	Greenwood Chemical Co	703-456-6832	State Hwy. #690, Greenwood, VA 22943.
GDC	Gresco, Mfg. Inc	919-475-8101	216 E. Holly Hill Rd., Thomasville, NC 27360.
GPI	Grinstead Products, Inc	913-764-8100	200 Industrial Parkway Industrial Airport, KA 66031.
GGI	Grow Group Inc	301-939-1234	1354 Old Post Rd., Havre De Grace, Md. 21078.
GRV	Guardsman Chemicals, Inc	616-452-5181	1350 Steele Ave. S.W., Grand Rapids, MI 49507.
GSS	Gulf States Steel, Inc	205-543-6201	174 South 26th St., Gadsden AL 35904-1935.
GTH	Guth Corp	414-488-3202	P.O. Box 347, Slinger, WI 53086.
HAR	Haarmann & Reimer Corp	201-686-3132	70 Diamond Rd., Springfield, NJ 07081.
HAL	C. P. Hall Co	312-767-4600	7300 S. Central Ave., Chicago, IL 60638.
HOC	Halocarbon Products Corp	201-343-8703	82 Burlews Ct., Hackensack, NJ 07601.
HTM	Haltermann Ltd. Co.	713-452-5951	16717 Jacintoport Blvd., Houston, TX 77015.
FOC	Handschy Industries, Inc., Ink and Chemical Div.	312-597-7990	13601 S. Ashland Ave., Riverdale, IL 60627-1099.
HAN	Hanna Chemical Coatings Corp	614-294-3361	1313 Windsor Ave., Columbus, OH 43216.
TMH	Harcros Chemicals, Inc	913-321-3131	5200 Speaker Rd., Kansas City, KS 66110.
HRT	Hart Products Corp	201-433-6665	173 Sussex St., Jersey City, NJ 07302.
HCC	Hatco Chemical Co	201-738-1000	King George Post Rd., Fords, NJ 08863.
HKY	Hawkeye Chemical Co	319-243-5800	P. O. Box 899, Clinton, IA 52732.
HAP	Helmerich & Payne, Inc., Natural Gas Odorizing Div.	713-424-5568	3601 Decker Dr., Baytown, TX 77520.
SCP	Henkel Corp	612-828-8000	2200 Remissance Blvd., Gulpn Mills, PA 19406.
HPC	Hercules, Inc	302-594-5000	Hercules Plaza, Wilmington, DE 19894.
HER	Heresite Protective Coating, Inc	414-684-6646	822 S. 14th St., Manitowoc, WI 54220.
HTN	Heterene Chemical Corp	201-278-2000	790 - 21st Ave., Paterson, NJ 07513.
HEU	Heubach Inc	201-596-6170	Heubach Ave., Newark, NJ 07114.
HEC	Hewchem	601-863-6600	P.O. Box 188, Gulfport, MS 39502.
HEW	Hewitt Soap Co., Inc	513-253-1151	333 Linden Ave., Dayton, OH 45403.
HXL	Hexcel Corp:		
	Chemical Products Div	805-498-1399	35470 Conejo Rd., Newbury Park CA 91320.
	Chemical Products Div	616-772-2193	215 N. Centennial St., Zeeland, MI 49464.
HIP	High Point Chemical Corp	919-884-2214	243 Woodbine St., High Point, NC 27261.
SDG	Hill Petroleum Company	203-661-4770	P.O. Box 5038, Houston, TX 77262-5038
SDH	Hilton Davis Chemical Co	513-841-4000	2335 Langdon Farm Rd., Cincinnati, OH 45237.
BEZ	Hi-Tek Polymer	502-499-4011	9808 Bluegrass Parkway, Louisville, KY 40299.
RPC	Hi-Tek Polymers, Inc., Lyndal Div	404-259-4831	1338 Coronet Dr., Dalton, GA 30720.
HDG	Hodag Chemical Corp	312-675-3950	7247 N. Central Park Ave., Skokie, IL 60076.

Table A-1—Continued

Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1988

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Identification Code	*Name of company*	*Telephone number*	*Office address*
HCL	Hoechst Celanese Corp:		
	Bayport Works	201-231-2000	12212 Port Rd., Pasadena, TX 77507.
	Chemical Group Div	214-689-4000	1250 W. Mockingbird Lane, Dallas, TX 75247.
	Engineering Plastics Div	201-635-2600	26 Main St., Chatham, NJ 07928.
	Fibers Div	704-554-2000	4000 Barclay Down Drive, Charlotte, NC 28232.
	Fibers Industrial Div	803-579-5522	P.O. Box 5887, Spartanburg, SC 29304-5887.
	Fine Chemical Div	804-393-3100	801 Water St., Portsmouth, VA 23704 .
	SpecialityChem Group Coventry Plant	201-231-2000	129 Quidnick St., Coventry, RI 02816.
	Sou-Tex	704-827-7531	P.O. Box 866, Mt. Holly, NC 28120.
HOF	Hoffmann-LaRoche, Inc	201-235-5000	340 Kingsland St., Nutley, NJ 07110.
HCP	Honig Chemical & Processing Corp	201-344-0881	414 Wilson Ave., Newark, NJ 07105.
EFH	E. F. Houghton & Co	215-666-4000	P.O. Box 930, Valley Forge, PA 19482.
NOD	Huls America, Inc	201-981-5000	80 Contennial Ave., Piscataway, NJ 08855-0456.
HML	Hummel Chemical Co., Inc	201-754-1800	10 Harmich Rd., S. Plainfield, NJ 07080.
HMY	Humphrey Chemical Co	203-281-0012	45 Divine St., N. Haven, CT 06473-0325.
HNT	Huntington Laboratories, Inc	219-356-8100	970 E. Tipton St., Huntington, IN 46750.
HMN	Huntsman Chemical Corp	801-532-5200	2000 Eagle Gate Tower, Salt City, UT 84111.
ICI	ICI Americas, Inc:		
	Agricultural Products Div	302-479-8000	Delaware Corp. Center, Wilmington, DE 19897.
	Films Group Div	302-575-3986	Concord Pike & Murphy Rd., Wilmington, DE 19897.
	Polyurethanes Group	609-423-7400	Mantua Grove Rd., W. Deptford, NJ 08066.
	Resin Div	617-658-6600	730 Main St., Wilmington, DE 19897.
	Speciality Product	302-575-3557	Concord Pike & Murphy Rd., Wilmington, DE 19897.
IMC	IMC Pittman-Moore	812-232-0121	P.O. Box 207, Terre Haute, IN 47808.
IMC	IMC Pittman-Moore Industrial Chemical Industrial Chemical Div	312-566-2600	421 E. Hawley St., Mundelein, IL 60060.
RAY	ITT Rayonier, Inc	203-348-7000	P.O. Box 68967, Seattle WA 98188.
IGC	Indiana Gas & Chemical Corp	812-232-0231	1341 Hulman St., Terre Haute, IN 47808.
IND	Indol Color Co., Inc	201-242-1300	1029 Newark Ave., Elizabeth, NJ 07201.
IDC	Industrial Color, Inc	815-722-7402	50 Industry Ave., Joliet, IL 60435.
INL	Inland Steel Co	312-346-0300	3210 Watling, St., E. Chicago, IL 46312.
WM	Inolex Chemical Co	215-271-0800	Jackson & Swanson Sts., Philadelphia, PA 19148.
SPC	Insilco Corp., Sinclair Paint Co. Div	213-268-2511	6100 South Garfield Ave., Los Angeles, CA
IMI	Insulating Materials, Inc	518-395-3304	1 Campbell Rd., Schenectady, NY 12306. 90040.
GBF	International Bio-Synthetics Inc	704-527-9000	P.O. Box 241068, Charlotte, NC 28224-1068.
IFF	International Flavor & Fragrances Inc	201-264-4500	1515 Highway #36, Union Beach, NJ 07735.
IPC	Interplastic Corp	612-331-6850	2015 NE Broadway, Minneapolis, MN 55413.
IOV	Iovite, Inc	312-481-8900	21625 Oak St., Matteson, IL 60443.
CRZ	James River II, Inc. Speciality Chemicals Div	206-834-8134	4th & Adams Sts., Camas, WA 98607.
JRC	Jarchem Industries, Inc	201-587-4551	40 Ball St., Newark, NJ 07105.
JFR	George A. Jeffreys & Co., Inc	703-389-8220	P. O. Box 909, Salem, VA 24153.
JRG	Andrew Jergens Co	513-421-1400	2535 Spring Grove Ave., Cincinnati, OH 45214.
JTO	Jetco Chemicals, Inc	214-872-3011	P. O. Box 1898, Corsicana, TX 75110.
MRX	Johnson Matthey, Inc.:	215-971-3000	2002 Nolte Dr., W. Deptford, NJ 08066.
JNS	S. C. Johnson & Son, Inc	414-631-2000	1525 Howe St., Racine, WI 53403.

Table A-1—Continued

Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1988

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JOB	Jones-Blair Co	214-353-1600	2728 Empire Central, Dallas, TX 75045.
KLM	Kalama Chemical, Inc	206-682-7890	Suite 1110, Bank of California Center, Seattle, WA 98164.
KTP	Kama Corp., Kent Polymers, Inc	717-455-2021	666 Dietrich Ave., Hazelton, PA 18201.
KAN	Kanasco, Ltd	301-789-7800	6118 Robinwood Road, Baltimore, MD 21125.
KMP	Kelly-Moore Paint Co., Inc	415-592-8337	987 Commercial St., San Carlos, CA 94070.
KMI	Kemin Industries, Inc	515-266-2111	2100 Maury St., Des Moines, IA 50301.
KPI	Kenrich Petrochemicals, Inc	201-823-9000	140 E. 22nd St., Bayonne, NJ 07002-0032.
KYS	Keysor Century Corp	805-259-2360	P. O. Box 308, Saugus, CA 91350.
KCW	Keystone Color Works, Inc	717-854-9541	151 W. Gay Ave., York, PA 17403.
CHF	Kincaid Enterprises, Inc	304-755-3377	P. O. Box 549, Nitro, WV 25143.
KHI	Koch Refining Co	316-832-5500	P. O. Box 2302, Wichita, KS 67201.
LCP	LCP Chemicals:		
	Maine Div. of Hanlin Group Inc	201-225-4840	P. O. Box 149, Orrington, ME 04474.
	West Virginia, Inc	304-843-1310	P. O. Box Box J, Moundsville, WV 26041.
LTV	LTV Steel Co., Inc	216-622-5000	LTV Steel Bldg., 25 W. Prospect Ave., Cleveland, OH 44115.
LKY	Lake States Div. of Rhinelander Paper Co.	715-369-4217	515 W. Davenport St., Rhinelander, WI 54501.
LRO	LaRoche Chemical, Inc	504-356-8406	P.O. Box 1031, Baton Rouge, LA 70821.
ARM	LaRoche Industries Inc	404-851-0407	1100 Johnson Ferry Rd., Alanta GA 30342.
LII	Lawter International, Inc	312-498-4700	990 Skokie Blvd., Northbrook, IL 60062.
LEA	Leatex Chemical Co	215-739-6324	2722 N. Hancock St., Philadelphia, PA 19133.
LLI	Lee Laboratories, Inc	804-862-2534	2999 Frontage Rd., Petersburg, VA 23805.
LVR	C. Lever Co., Inc	*215-639-8640	736 Dunks Ferry Rd., Bensalem, PA 19020.
LEV	Lever Brothers Co	212-688-6000	390 Park Ave., New York, NY 10022.
LIL	Eli Lilly & Co	317-261-2000	Lilly Corporate Center, Indianapolis, IN 46285.
	Eli Lilly Industries, Inc	809-757-4000	Call Box 1198 - Pueblo Station, Carolina, PR 00630-1198.
LIC	Lilly Industrial Coatings, Inc	317-634-8512	P. O. Box 946, Indianapolis, IN 46206.
LMC	Lomac, Inc	616-788-2341	5025 Evanston Ave., Muskegon, MI 49443.
BRD	Lonza, Inc	201-794-2400	17-17 Route 208, Fair Lawn, NJ 07410.
LC	Lord Corp., Chemical Products Group	814-868-3611	2000 W. Grandview Blvd., Erie, PA 16514-0038.
LCS	Louisiana Chemical Polymers	504-775-1801	12537 Scenic Hwy., Baton Rouge, LA 70807.
LYP	Lyondell Petrochemical Co	713-652-7200	1221 McKinney, Suite 1600, Houston, TX 77253-3646.
MCK	MacKenzie Chemical Works, Inc	504-886-2173	Rte 2 Box 667, Deer Park, NY 11729.
MCC	McCloskey Corp. McCloskey Varnish Co.:	215-624-4400	7600 State Rd., Philadelphia, PA 19136.
	McCloskey Varnish Co., California	213-726-7272	5501 E. Slanson Avenue, Los Angeles, CA 90040.
STG	McCloskey Varnish Co., Oregon	503-226-3751	4155 N.W. Yeon Ave., Portland, OR 97210.
	McCormick & Co., Inc., McCormick-Stange, Flavor Div.	301-667-7401	230 Schilling Circle S., Hunt Valley, MD 21031.
MGK	McLaughlin Gormley King Co	612-544-0341	8810 - 10th Ave., N., Minneapolis, MN 55427.
MNP	McWhorter, Inc	312-428-2657	400 E. Cottage Place, Carpentersville, IL 60110.
MAK	MAK Chemical Corp	317-288-4464	1200 Rochester Ave., Muncie, IN 47307-0423.

Table A-1—Continued

Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1988

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Identification Code	*Name of company*	*Telephone number*	*Office address*
SOR	MW Manufacturers, Inc., Southern Resin Div	919-475-1348	P.O. Box 68, Thomasville, NC 27360.
TZC	Magnesium Elektron, Inc	201-782-5800	500 Point Breeze Road, Flemington, NJ 08822.
MGR	Magruder Color Co., Inc	201-242-1300	1029 Newark Ave., Elizabeth, NJ 07208.
MAL	Mallinckrodt, Inc	314-895-2000	675 McDonnell Blvd., St. Louis MO 63042.
KCH	Manchem, Inc	215-837-1808	275 Keystone Dr., Bethlehem, PA 18017.
MOC	Marathon Petroleum Co., Texas Refining Div	419-422-2121	539 S. Main St., Findlay, OH 45840.
MRV	Marlowe-Van Loan Corp	919-882-3351	1511 Joshua Circle, High Point, NC 27261.
MCA	Masonite Corp., Alpine Resin Div	312-750-0900	P.O. Box 1048, Laurel, MS 39441.
MAX	Max Marx Color Corp	201-373-7801	1200 Grove St., Irvington, NJ 07111.
MYO	Mayo Chemical Co	404-696-6711	5544 Oakdale Rd., Smyrna, GA 30081.
MLC	Melamine Chemicals, Inc	504-473-3121	P. O. Box 748, Donaldsonville, LA 70346.
MRK	Merck & Co., Inc	201-574-4000	P. O. Box 2000, Rahway, NJ 07065.
MER	Merichem Co	713-455-1311	1914 Haden Rd., Houston, TX 77015.
MLS	Miles Laboratories, Inc: Biotechnology Group	219-262-7445	1127 Myrtle St., Elkhart, IN 46515.
MIL	Milliken & Co., Milliken Chemical Div	803-472-9041	P. O. Box 817, Inman, SC 29349.
MMM	Minnesota Mining & Manufacturing Co	612-733-3647	3M Center 224-6S, St. Paul, MN 55144.
MIR	Miranol Chemical Co., Inc	201-329-3900	P. O. Box 436, 68 Culver Rd.,Dayton, NJ 08810.
MSC	Mississippi Chemical Corp	601-746-4131	P. O. Box 388, Yazoo City, MS 39194.
	Mobay Chemical Corp.:		
CHG	Agricultural Chemicals Div	816-242-2345	Hawthorne Rd., Kansas City, MO 64120.
VPC	Dye & Pigment Div	201-686-3700	Mobay Road, Pittsburgh, PA 15205.
MOB	Pittsburgh Div	412-777-2000	Mobay Road, Pittsburgh, PA 15205.
DKA	Mobay Synthetics Corp	713-477-8821	8701 Park Place Blvd., Houston, TX 77017.
SM	Mobil Oil Corp.:		
	Gas Liquids Dept	703-849-3000	P. O. Box 900, Dallas, TX 75221.
	Mobil Chemical Co. Polystyrene Business	201-321-6000	P. O. Box 240, Edison, NJ 08818.
	Chemical Products Div	201-321-6000	P. O. Box 250, Edison, NJ 08818.
	Petrochemicals Div	713-590-7700	World Towers One, 15600 Kennedy Blvd., Houston, TX 77032.
MOA	Mona Industries, Inc	201-345-8220	76 E. 24th St., Paterson, NJ 07544.
MON	Monsanto Co	314-694-1000	800 N. Lindbergh Blvd., St. Louis, MO 63167.
MNA	Monsanto Agricultural Co	314-694-1000	800 N. Lindbergh Blvd., St. Louis, MO 63167.
MCI	Mooney Chemicals, Inc	216-781-8383	2301 Scranton Rd., Cleveland, OH 44113.
MCP	Moretex Chemical Products, Inc	803-583-8441	314 W. Henry St., Spartanburg, SC 29304.
MRF	Morflex Chemical Co., Inc	919-292-1781	2110 High Point Road, Greensboro, NC 27403.
	Morton Thiokol, Inc.:		
MRT	Morton Chemical Div Morton Thiokol, Inc	312-807-2000	333 W. Wacker Dr. Chicago, IL 60606.
PYI	Morton Chemical Div	312-807-2000	Mountain Creek Church Rd., Greenville, SC 29602.
CCW	Ventron Div	513-733-2100	2000 West St., Reading, OH 45215.
MHI	Ventron Div	508-774-3100	150 Andover St., Danvers, MA 01923.
MOT	Motomco, Ltd	608-244-2904	P. O. Box 8422, Madison, WI 53708.
RTC	Mount Vernon Mills, Inc	803-233-4151	One Shelter Place, Greenville, SC 29602.
PNX	The Murphy-Phoenix Co	216-831-0404	25800 Science Park Dr., P.O. Box 22930, Beechwood, OH 44122.
NTL	NL Chemicals Div	609-443-2000	P. O. Box 700, Hightstown, NJ 08520.
NTL	NL Industries, Inc	609-443-2000	P.O. Box 700 Hightstown, NJ 08520.

Table A-1—Continued

Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1988

(Names of synthetic organic chemicals manufacturers that reported production and/or sales to the U.S. International Trade Commission for 1988 are listed below alphabetically, together with their identification codes as used in each of the 15 individual sections of this report)

Identification Code	*Name of company*	*Telephone number*	*Office address*
LEM	Napp Chemicals, Inc	201-773-3900	199 Main St., Lodi, NJ 07644.
NTC	National Casein Co	312-846-7300	601 W. 80th St., Chicago, IL 60620.
NCJ	National Casein of New Jersey	312-846-7300	601 W. 80th St., Chicago, IL 60620.
NMC	National Milling & Chemical Co., Inc	215-482-6600	4601 Flat Rock Rd., Philadelphia, PA 19127.
NSC	National Starch & Chemical Corp	201-685-5000	10 Finderne Ave., Bridgewater, NJ 08807.
NTS	National Steel Corp., Great Lakes Plant	313-297-3000	1 Quality Dr., Ecorse, MI 48229.
NEP	Nepera, Inc	914-782-1200	Route #17, Harriman, NY 10926.
NEV	Neville Chemical Co	412-331-4200	2800 Neville Rd., Pittsburgh, PA 15225.
NBC	New Boston Coke Corp	614-456-4154	600 River Ave., New Boston, OH 45662.
NCC	Niacet Corp	716-285-1474	400 - 47th St., Niagara Falls, NY 14304.
NLO	Niklor Chemical Co., Inc	213-830-2253	2060 E. 220th St., Long Beach, CA 90810.
NCP	Niles Chemical Paint Co	616-683-3377	P. O. Box 307, Niles, MI 49120.
NOC	The Norac Co., Inc	818-334-2908	405 S. Motor Ave., Azusa, CA 91702.
	Mathe Div	201-779-4981	169 Kennedy Dr., Lodi, NJ 07644-0230.
FSN	NOR-AM Chemical Co	302-575-2000	3509 Silverside Road, Wilmington, DE 19803.
NPC	Northwest Petrochemical Corp.	206-293-3176	P.O. Box 99, Anacortes, WA 98221.
NW	Northwestern Chemical Co	312-231-6111	120 N. Aurora St., West Chicago, IL 60185.
NOR	Norwich Eaton Pharmaceutical, Inc	607-335-2111	17 Eaton Ave., Norwich, NY 13815.
NBI	Novo Biochemical Industries, Inc	919-494-2014	State Road 1003, Franklinton, NC 27525.
NSW	The Nutrasweet Co	312-940-9800	1751 Cook Road, Deerfield, IL 60015.
NUT	Nutrius, Inc	216-526-5522	8221 Brecksville Rd., Brecksville, OH 44141.
OBC	The O'Brien Corp	415-871-6060	450 E. Grand Ave., S. San Francisco, CA 94080.
	Occidential Chemical Corp.:		
HKD	Durez Div	716-696-6000	Walck Rd., N. Tonawanda, NY 14120.
HKO	Olefins Div	318-437-8100	One Lakeshore Dr., Suite 1895 Lake Charles, LA 70629.
HKP	PVC Div	215-251-1000	P. O. Box 1772, Berwyn, PA 19312.
HK	ED & S Div.	214-404-3300	5005 LBJ Freeway, Dallas, TX 75244.
EPI	Ohio Rubber Eagle Pitcher Ind Orthane Div.	817-387-0585	P.O. Box 1398, Denton, TX 76202.
OMC	Olin Corp	203-356-2000	120 Long Ridge Rd., Stamford, CT 06904.
WAY	Olin Hunt Speciality Products, Inc.	201-977-6000	One Wellington Rd., Lincoln, RI 02865.
OC	Omega Chemicals, Inc	803-582-5346	P.O. Box 1723, Spartanburg, SC 29304
ORG	Organics/LaGrange, Inc	312-764-6700	7125 N. Clark St., Chicago, IL 60626.
OCC	Orient Chemical Corp	201-465-0714	121 Tyler St., Port Newark, NJ 07114.
BSW	Original Bradford Soap Works, Inc	401-821-2141	200 Providence St., W. Warwick, RI 02893.
CJO	C. J. Osborn Chemicals, Inc	609-662-0128	820 Sherman Ave., Pennsauken, NJ 08110.
OCF	Owens-Corning Fiberglas Corp	419-248-8000	Fiberglas Tower, Toledo, OH 43659.
PBI	PBI-Gordon Corp	816-421-4070	1217 W. 12th St., Kansas City, MO 64101-9984.
PDG	P.D. Glycol	409-838-4521	P.O. Box 3785, Beaumont, TX 77704.
PSG	PMC Specialities Group, Inc	216-356-0700	20525 Center Ridge Rd, Rocky River, OH 44116.
PMP	PMP Fermentation Products, Inc	414-352-3001	7670 N. Port Washington Rd., Milwaukee, WI 53217.
PPG	PPG Industries, Inc	412-434-3131	One PPG Place, Pittsburgh, PA 15272.
PPS	P/P Splitter Venture	713-972-1307	6161 Savoy Dr. Suite 222, Houston, TX 77036.
PAC	Pacific Anchor Chemical Corp	213-725-1800	5701 S. Eastern Ave. Suite 530, Los Angeles, CA 90040.

Table A-1—Continued

Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1988

(Names of synthetic organic chemicals manufacturers that reported production and/or sales to the U.S. International Trade Commission for 1988 are listed below alphabetically, together with their identification codes as used in each of the 15 individual sections of this report)

Identification Code	Name of company	Telephone number	Office address
PRA	Para-Chem.Southern Inc	803-967-7691	P.O. Box 127, Simpsonville, SC 29681.
PAH	Parish Chemical Co	801-226-2018	145 N. Geneva Rd., Orem, UT 84057.
PD	Parke-Davis Div., of Warner Lambert, Inc	616-392-2375	188 Howard Ave., Holland, MI 49424.
PSC	Passaic Color & Chemical Co	201-279-0400	28-36 Paterson St., Paterson, NJ 07501.
PAT	Pat-Chem, Inc	803-233-3941	11 Worley Rd., Greenville SC 29602.
CHP	C. H. Patrick & Co., Inc	803-244-4831	P. O. Box 2526, Greenville, SC 29602.
PEL	Pelron Corp	312-442-9100	7847 W. 47th St., Lyons, IL 60534.
PEN	Penick Corp	201-621-2804	158 Mount Olive Ave., Newark NJ 07714
PAS	Pennwalt Corp	215-587-7000	Three Parkway, Philadelphia, PA 19102.
WTL	Lucidol Div	716-877-1740	1740 Military Rd., Buffalo, NY 14240.
PAR	Penreco, Pennzoil Products Co., Div	713-337-1534	4401 Park Ave., Dickinson, TX 77539.
BPT	Permuthane Coating, Inc	617-531-1880	13 Corwin St., Peabody, MA 01960.
PST	Perstorp Compounds, Inc	413-584-2472	238 Nonotuck St., Florence, MA 01060.
PST	Perstorp Polyols, Inc	419-729-5448	600 Matzinger Rd., Toledo, OH 43612.
PFN	Pfanstiehl Laboratories, Inc	312-623-0370	1219 Glen Rock Ave., Waukegan, IL 60085.
PCW	Pfister Chemical, Inc	201-945-5400	Linden Ave., Ridgefield, NJ 07657.
PFZ	Pfizer, Inc	212-573-2323	235 E. 42nd St., New York, NY 10017.
	Pfizer Pharmaceuticals, Inc	809-846-4300	P. O. Box 628, Barceloneta, PR 00617.
PHR	Pharmachem Corp	215-867-4654	719 Stefko Blvd., P.O. Box 1035 Bethlehem, PA 18016.
PLB	Pharmacia P-L Biochemicals, Inc	414-225-2600	2202 N. Bartlett Ave., Milwaukee, WI 53202.
PDI	Phelps Dodge Industries, Inc. Phelps Dodge Magnet Wire Co. Div.	219-456-4444	4300 New Haven Ave., Fort Wayne, IN 46803.
PPX	Phillips Paraxylene, Inc	809-864-1515	P. O. Box 1166, Guayama, PR 00655.
PLC	Phillips 66 Co	918-661-6600	Phillips Bldg., Bartlesville, OK 74006.
PPR	Phillips Puerto Rico Core, Inc	809-864-1515	P. O. Box 1166, Guayama, PR 00655.
PHC	Phthalchem, Inc	513-681-0099	266 W. Mitchell Ave., Cincinnati, OH 45232.
PCI	Piedmont Chemical Industries, Inc	919-885-5131	331 Burton Ave., High Point, NC 27261.
PIC	Pierce Chemical Co	815-968-0747	3747 N. Meridan Rd., Rockford, IL 61103.
PIL	Pilot Chemical Co	213-723-0036	11756 Burke St., Santa Fe Springs, CA 90670.
PKL	Plaskolite, Inc	614-294-3281	P. O. Box 1497, Columbus, OH 43216.
PSL	Plaslok Corp	716-681-7755	3155 Broadway, Buffalo, NY 14227.
PLS	Plastics Engineering Co	414-458-2121	3518 Lakeshore Rd., Sheboygan, WI 53081.
PMC	Plastics Manufacturing Co	214-330-8671	2700 S. Westmoreland, Dallas, TX 75233.
PTC	Polycast Technology Corp	203-327-6010	70 Carlisle Pl., Stamford, CT 06902.
PLR	Polysar, Inc Plastics Div	671-537-9901	29 Fuller St., Leominster, MA 01453.
PRT	Pratt & Lambert, Inc	716-873-6000	P.O. Box 22, Buffalo, NY 14240.
JLP	J. L. Prescott Co	201-777-4200	27 8th St., Passaic, NJ 07055.
PCH	Prochem, Inc	215-436-4812	116 Concord MTG. Road, Glen Mills, PA 19342.
PG	Procter & Gamble Co., Procter & Gamble Mfg. Co.	513-627-5194	P. O. Box 599, Cincinnati, OH 45201.
PRC	Products Research & Chemical Corp	818-240-2060	5430 San Fernando Rd., Glendale, CA 91209.
CP	Quaker Chemical Corp	215-828-4250	Elm & Lee Sts., Conshohocken, PA 19428-0809.
	Quantum Chemical Corp.:		
EMR	Quantum Chemical Corp. Emery Div	212-919-5000	11501 NorthLake Dr., Cincinnati, OH 19134.
TCH	Emery Div	803-963-4031	P.O. Box 628, Mauldin, SC 29662.
USI	USI Div	513-530-6580	11500 Northlake Dr., Cincinnati, OH 45249.

Table A-1—Continued

Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1988

(Names of synthetic organic chemicals manufacturers that reported production and/or sales to the U.S. International Trade Commission for 1988 are listed below alphabetically, together with their identification codes as used in each of the 15 individual sections of this report)

Identification Code	*Name of company*	*Telephone number*	*Office address*
QUN	K. J. Quinn & Co., Inc.	617-321-3200	135 Folly Mill Rd., Seabrook, NH 03874.
RSA	R.S.A. Corp	914-693-1818	690 Saw Mill River Rd., Ardsley, NY 10502.
RCN	Racon, Inc	316-524-3245	6040 S. Ridge Rd., Wichita, KS 67201.
BLC	Ranbar Technology, Inc., Ball Chemical Co	412-486-1111	1114 William Flinn Highway, Glenshaw, PA 15116.
RAB	Raytech Corp	203-371-0101	1204 Darlington Ave., Crawfordsville, IN 47933.
RBI	Reeves Brothers, Inc	803-576-1210	P. O. Box 1898, Spartanburg, SC 29304.
REG	Regis Chemical Co	312-967-6000	8210 Austin Ave., Morton Grove, IL 60053.
RCI	Reichhold Chemicals, Inc	914-682-5700	525 N. Broadway, White Plains, NY 10603.
RIL	Reilly Tar & Chemical Corp	317-638-7531	151 N. Delaware St., 1510 Market Square Center, Indianapolis, IN 46204.
RIL	Reilly-Whiteman Inc	215-423-5300	2600 E. Tioga St., Philadelphia, PA. 19134.
REL	Reliance Universal, Inc., Louisville Resins Div	502-459-9110	P.O. Box 37510, Louisville, KY 40232.
REM	Remington Arms Co., Inc	302-774-1000	615 Asylum St., Bridgeport, CT 06601-2190.
ELP	Rexene Products Co	214-450-9000	5005 LBJ Freeway Occidental Tower, Dallas TX 75244.
RDA	Rhone-Poulenc, Inc	201-821-1000	CN 5266 Princeton, NJ 08543-5266.
RCD	Richardson Polymer Corp	203-245-0441	17 Woodland Rd., Madison, CT 06443.
AMS	Ridgway Color Co	513-771-1900	75 Front St., Cincinnati 45215
RIK	Riker Laboratories, Inc. Sub. of 3M Co	818-341-1300	19901 Nordhoff St., Northridge, CA 91324.
RIV	Riverdale Chemical Co	312-754-3330	220 E. 17th St., Chicago Heights, IL 60411.
ROB	Robeco Chemicals, Inc.,	212-986-6410	99 Park Ave., New York, NY 10016.
ORT	Roehr Chemicals, Inc, Div. of Aceto	718-784-8473	52-20 37th St., Long Island City, NY 11101.
RH	Rohm & Haas Co	215-592-3000	Independence Mall West., Philadelphia, PA 19105.
ROM	Roma Color, Inc	617-676-3481	749 Quequechan St., Fall River, MA 02723.
RUC	Rubicon, Inc	504-673-6141	P. O. Box 517, Geismar, LA 70734.
RUO	Ruco Polymer Corp	516-931-8104	New South Rd., Hicksville, NY 11802.
NES	Ruetgers-Nease Chemical Co	814-238-2424	201 Struble Rd., State College, PA 16801.
SBP	SBS Products Inc	517-799-4941	302 Waller St., Saginaw, MI 48605.
SCM	SCM Corp.:		
	Glidco Organics	904-768-5800	P.O. Box 389, Jacksonville, FL 32201
	PCR, Inc	904-376-8246	P.O. Box 1466, Gainesville, FL 32609.
SOS	SSC Industries, Inc	404-762-9651	1550 E. Taylor Ave., East Point, GA 30344.
NPR	Safeway Stores, Inc	415-944-4329	2800 Ygnacio Valley Rd., Walnut Creek, CA 94598.
STX	St. Croix Petrochemical Corp	809-778-6450	P. O. Box 6801, Sunny Isle, St. Croix, U.S. VI 00823-6801.
SLM	Salem Oil & Grease Co	508-745-0585	60 Grove St., Salem, MA 01970.
SAL	Salsbury Laboratories, Inc	515-257-2422	2000 Rockford Rd., Charles City, IA 50616.
SBG	Samuel Bingham Co	312-298-6777	479 Business Center Dr., Suite 109, Franklin Park, IL 60131.
	Sandoz Corp.:		
SCM	Sandoz Chemical Corp	704-331-7016	4000 Monroe Rd., Charlotte, NC 28205.
ZOC	Sandoz Corp. Protection	312-699-1616	1300 E. Toulty Ave., Des Plaines, Il 60018.

Table A-1—Continued

Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1988

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Identification Code	*Name of company*	*Telephone number*	*Office address*
SCN	Schenectady Chemicals, Inc	518-370-4200	P. O. Box 1046, Schenectady, NY 12306.
SBC	Scher Chemicals, Inc	201-471-1300	Industrial West, Clifton, NJ 07012.
SCH	Schering Corp	201-298-4000	1011 Morris Ave., Union, NJ 07083.
SCO	Scholler, Inc	215-739-0900	P. O. Box 26968, Philadelphia, PA 19134.
SPR	Scientific Protein Laboratories	608-849-5944	700 E. Main St., Waunakee, WI 53597.
SPA	Scott Paper Co	215-521-5000	P. O. Box 925, Everett, WA 98206.
TXS	Scott Polymers Inc	817-831-3541	3607 N. Sylvania Ave., Fort Worth, TX 76111.
SRL	G. D. Searle & Co	312-982-7000	5200 Old Orchard Rd., Skokie, IL 60077.
BRI	Sedgefield Specialities	919-379-2000	3330 W. Friendly Ave., Greensboro, NC. 27406.
SQA	Sequa Chemicals, Inc	803-385-5181	P.O. Box 70, Chester, SC 29706.
SKP	Shakespeare Monofilament Div	803-754-7011	6111 Shakespeare Rd., Columbia, SC 29240.
SHO	Shell Oil Co	713-241-1242	P. O. Box 3105, Houston, TX 77002.
SHC	Shell Chemical Co	713-241-1242	P. O. Box 3105, Houston, TX 77002.
SGO	Shenango, Inc	412-771-4400	200 Neville Rd., Pittsburgh, PA 15225-1690.
SHP	Shepherd Chemical Co	513-731-1110	4900 Beech St., Cincinnati, OH 45212.
SHX	Sherex Chemical Co., Inc	614-764-6500	5777 Frantz Rd., Dublin, OH 43017.
	The Sherwin-Williams Co.:		
SW	Sherwin-Williams Co	216-566-2000	11541 S. Champlain, Chicago, IL 60628.
SW	Sherwin-Williams Co	216-566-2000	2802 W. Miller Rd., Garland TX 75041.
BAL	Consumer Div	301-625-8284	2325 Hollins Ferry Rd., Baltimore, MD 21230.
SHT	Shintech, Inc	713-965-0713	24 Greenway Plaza, Suite 811, Houston, TX 77046.
SMP	J. R. Simplot Co	208-336-2110	P.O. Box 912 Pocatello, ID 83204.
UPF	Sloss Industries	205-254-7801	P.O. Box 5327 Birmingham, AL 35207.
GFS	G. Frederick Smith Chemical Co	614-881-5501	P. O. Box 23214, Columbus, OH 43223.
SK	SmithKline Beckman Corp	215-751-4000	One Franklin Plaza, Philadelphia, PA 19101.
SMO	Smooth-On, Inc	201-647-5800	1000 Valley Rd., Gillette, NJ 07933.
SIO	Sohio Oil Co	419-226-2300	1150 S. Metcalf St., Lima, OH 45804.
SLT	Soltex Polymer Corp	713-522-1781	P. O. Box 1000, Deer Park, TX 77536.
SLC	Soluol Chemical Co., Inc	401-821-8100	Green Hill & Market Sts., W. Warwick, RI 02893.
SAC	Southeastern Adhesives Co	704-754-3493	815 D Virginia St., SW., Lenoir, NC 28645.
	Southland Corp.:		
SOM	Great Meadows Div	214-828-7011	Alphano Rd., Great Meadows, NJ 07838.
SWR	Southwestern Refining Co., Inc	512-884-8863	P. O. Box 9217, Corpus Christi, TX 78469.
SPL	Spaulding Composites Co.,	716-692-2000	310 Wheeler St., Tonawanda, NY 14150.
ASL	SpecialtyChem Products Corp	715-735-9033	2 Stanton St., Marinette, WI 54143.
SOI	Specialty Organics, Inc	818-962-2008	5623 N. 4th St., Irwindale, CA 91706.
IPP	Spectrachem Corp	201-595-8181	200 Sheridan Ave., Paterson, NJ 07512.
TRD	Squibb Manufacturing, Inc	809-852-1255	P. O. Box 609, Humacao, PR 00661.
SCC	Standard Chlorine of Delaware, Inc	201-997-1700	1035 Belleville Turnpike, Kearny, NJ 07032.
STP	Stepan Co	312-446-7500	RR #1, Elwood, IL 60421 and 100 W. Henter Ave., Maywood, NJ 07607.
SC	Sterling Chemicals, Inc	409-942-3360	201 Bay St. South, Texas City, TX 77592-1311.
SD	Sterling Drug, Inc	212-907-2000	2144 E. State St., Trenton, NJ 08619.
SDW	Sterling Organics Div	212-907-2000	90 Park Ave., New York, NY 10016.
SD	Sterling Pharmaceuticals, Inc	212-907-2000	P. O. Box 11247, Barcelonita, PR 00617.
PPL	Sterling Engineered Products	207-784-9111	1 Pionite Road, Auburn, ME 04210.
CIN	Stockhausen, Inc	919-378-9393	2408 Doyle St., Greensboro, NC 27406.
IRI	Stuart-Ironsides, Inc	312-655-4595	7575 Plaza Court Willowbrook, IL 60521

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Identification Code	*Name of company*	*Telephone number*	*Office address*
SNA	Sun Chemical Corp., Pigments Div	212-986-5500	411 Sun Ave., Cincinnati, OH 45232.
SUN	Sun Company, Inc	215-977-6358	1801 Market St., Philadelphia, PA 19103.
RAS	Surface Coatings, Inc	617-933-4200	100 Eames St., Wilmingon, MA 01887.
JSC & TCC	Sybron Chemical, Inc	609-893-1100	P.O. Box 66, Birmingham Rd., Birmingham, NJ 08011.
INP	Synair Corp	615-698-8801	2003 Amnicola Hwy., Chattanooga, TN 37406.
BUC	Synalloy Corp., Blackman Uhler Chemical Div.	803-585-3661	P. O. Box 5627, Spartanburg, SC 29304.
SRY	Synray Corp	201-245-2600	209 N. Michigan Ave., Kenilworth, NJ 07033.
HFT	Syntex Agribusiness, Inc.,	417-866-7291	P. O. Box 1246, Springfield, MO 65801.
SYP	Synthetic Products Co., Div of Plastic Specialties & Technology	216-531-6010	1000 Wayside Rd., Cleveland, OH 44110.
SYT	Synthron, Inc	704-437-8611	P. O. Box 1111, Morganton, NC 28655.
TEK	Teknor Apex Co	401-725-8000	505 Central Ave., Pawtucket, RI 02861.
TLI	Teledyne Industries, Inc., Teledyne McCormick Selph	408-637-3731	3601 Union Rd., Hollister, CA 95024-0006.
TOC	Tenneco Oil Co Processing & Marketing	713-757-3373	P. O. Box 2511, Houston, TX 77001.
TEN	Tennessee Chemical Co	615-496-3331	1 Ocoee St., Copperhill, TN 37317.
TVA	Tennessee Valley Authority, NFDC, TVA, OACD, Div. of Developmental Production	205-386-3522	Muscle Shoals, AL 35660.
TU	Tenn-USS Chemicals Co	713-884-4400	4403 LaPorte Hwy, Pasadena, TX 77501.
TER	Terra International, Inc	712-277-1340	Terra Centre, 600 - 4th St., Sioux City, IA 51101.
TER	Terra Nitrogen, Inc	712-277-1340	Terra Centre, 600 - 4th St., Sioux City, IA 51101.
TX	Texaco, Inc., Texaco Chemical Co	713-432-3734	4800 Fournace Place, Bellaire, TX 77401.
TSA	Texas Alkyls, Inc	713-479-8411	P. O. Box 600, Deer Park, TX 77536.
TCR	Texas City Refining, Inc	409-945-4451	P. O. Box 1271, Texas City, TX 77592.
TPC	Texas Petrochemicals Corp	713-477-9211	8600 Park Place Blvd., Houston, TX 77017.
TWD	Tonawanda Coke Corp	716-876-6222	P.O. Box A-500 Tonawanda, NY 14151
TRI	Triad Chemical	504-473-9231	P. O. Box 310, Donaldsonville, LA 70346.
TRC	Trimont Chemical	401-333-4100	1224 Mendon Rd., Cumberland, RI 02864
TRO	Troy Chemical Co	201-589-2500	One Avenue L, Newark, NJ 07105.
TUL	Tull Chemical Co., Inc	205-831-1154	P. O. Box 3246, Oxford, AL 36203.
TLC	Twin Lake Chemical, Inc	716-433-3824	520 Mill St., Lockport, NY 14094.
UPM	UOP, Inc	312-391-2000	25 E. Algonquin Road, Des Plaines, IL 60017-5017.
UHL	Paul Uhlich & Co., Inc	914-478-2000	1 Railroad Ave., Hastings-on-Hudson, NY 10706.
UNG	Ungerer & Co	201-628-0600	4 Bridgewater Lane, Lincoln Park, NJ 07035.
DRL	Unichema Chemical, Inc	201-327-6100	4650 S. Racine Ave., Chicago, IL 60609.
WTH	Union Camp Corp	201-628-9000	875 Harger Street Dover, OH 44622.
NCI	Terpene & Aromatics Div	201-628-2000	P. O. Box 37617, Jacksonville, FL 32236.
UCC	Union Carbide Corp	203-794-3113	P.O. Box 8361, S. Charleston, WVA 25303.
UOC	Union Oil Co. of California	213-977-7746	1201 W. Fifth St., Los Angeles, CA 90017.
UTP	Union Texas Products Corp	713-968-2366	1330 Post Oak Blvd. Houston TX 77252-2120.
USR	Uniroyal Chemical Co.,Div	203-573-3886	World Headquarters, Middlebury, CT 06749
UNN	United Aniline Co	617-762-4057	Endicott St., Norwood, MA 02062.
UNO	United Erie, Inc	814-456-7561	438 Huron St., Erie, PA 16502.

Table A-1—Continued

Synthetic organic chemicals alphabetical directory of manufacturers, by company, 1988

(Names of synthetic organic chemicals manufacturers that reported production and/or sales to the U.S. International Trade Commission for 1988 are listed below alphabetically, together with their identification codes as used in each of the 15 individual sections of this report)

Identification Code	*Name of company*	*Telephone number*	*Office address*
USB	U.S. Borax & Chemical Corp., U.S Borax Research Corp	213-251-5600	3075 Wilshire Blvd., Los Angeles, CA 90010.
USX	U.S. Steel, Div. Of USX:		
	Clairton Plant	412-433-5425	600 Grant St., Pittsburgh, PA 15230.
	Gary Works	219-888-4794	600 Grant St., Pittsburgh, PA 15230.
UTC	Unitex Chemical Corp.	919-378-0965	520 Broome Rd. Greensboro, N.C 27405.
UPJ	The Upjohn Co	616-323-4000	7000 Portage Rd., Kalamazoo, MI 49001
CWN	Fine Chemicals	203-281-2722	410 Sackett Point Rd., North Haven, CT 06473.
VSV	Valentine Sugars, Inc	504-532-2541	Rt 2, Box 625, Lockport, LA 70374.
VLR	Valero Refining Co	512-246-2000	530 McCullough, San Antonio, TX 78215.
VCM	Vanchem, Inc	716-434-2624	1 N. Transit Rd., Lockport, NY 14094.
VDM	Van De Mark Chemical Co., Inc	716-433-6764	1 N. Transit Rd., Lockport, NY 14094.
VNC	Vanderbilt Chemical Corp	203-744-3900 203-853-1400	31 Taylor Ave., Bethel, CT 06801 and Rt. #2, Box 54, Murray, KY 42071.
VND	Van Dyk, Div. of Mallinckrodt, Inc	201-450-3206	Main & William Sts., Belleville, NJ 07109.
VEL	Velsicol Chemical Corp	312-698-9700	5600 N. River Rd., Rosemont, IL 60018.
VIK	Viking Chemical Co	612-333-0394	838 Baker Bldg., Minneapolis, MN 55402.
VIN	Vineland Chemical Co., Inc	609-691-3535	W. Wheat Rd., Vineland, NJ 08360.
VCC	Vinings Industries, Inc	404-436-1542	3950 Cumberland Pkwy., Atlanta, GA 30339.
VKR	Virkler Co	704-527-2350	1022 Pressley Rd., Charlotte, NC 28210.
VST	Vista Chemical Co	713-531-3200	15990 N. Barker's Landing Rd., Houston, TX 77224.
VTM	Vitamins, Inc	312-861-0700	200 E. Randolph Dr., Chicago, IL 60601.
FRO	Vulcan Materials Co., Chemicals Div	205-877-3000	P. O. Box 7689, Birmingham, AL 35233.
VYN	Vygen Corporation	216-998-1120	Middle Road, Ashtabula, OH 44004.
SWS	Wacker Silicones Corp	517-263-5711	3301 Sutton Rd., Adrian, MI 49221.
WJ	Warner-Jenkinson	314-889-7600	2526 Baldwin St., St. Louis, MO 63106.
WES	Wesley Industries, Inc	205-626-2040	P.O. Box 490, Montrose, AL 36559.
WCA	West Coast Adhesives Co	503-286-3515	11104 NW Front Ave., Portland, OR 97231.
GCC	Western Branch Holding Co	212-819-5500	P.O. Box 27147 Memphis TN 38127.
EW	Westinghouse Electric Corp., Insulating Materials Div	412-864-7960	Route 993, Manor, PA 15665.
WPG	WestPoint Pepperell, Inc Grifftex Chemical Co. Sub.	404-645-4753	1900 Cunningham Dr., Opelika, AL 36801.
WVA	Westvaco Corp	212-688-5000	P. O. Box 70848, Charleston Heights, SC 29415.
WRD	Weyerhauser Co	715-384-2141	118 S. Palmetto Ave., Marshfield, WI 54449.
WPS	Wheeling-Pittsburgh Steel Corp	304-234-2439	1134 Market Square Wheeling, W VA 26003.
WCC	White Chemical Corp	201-621-4100	660 Frelinghuysen Ave., Newark, NJ 07114.
WTK	Whittaker Corp., Helco Chemicals Div	717-476-0353	Rt. 611, Delaware Water Gap, PA 18327.
WHW	Whittmore-Wright Co., Inc	617-242-1180	62 Alford St., Boston, MA 02129.
CHN	Wil-Gro Fertilizer, Inc	918-825-3383	P.O. Box 429, Pryor, OK 74362.
WLM	Wilmington Chemical Corp	302-658-3515	Pyles Lane, Wilmington, DE 19899.
WTC	Witco Corp	201-573-2800	155 Tice Blvd., Woodcliff Lake, NJ 07675.
WCL	Wright Corp	919-251-0234	102 Orange, Wilmington, NC 28403.
WYK	Wyckoff Chemical Co., Inc	616-637-8474	1421 Kalamazoo St., S. Haven, MI 49090.
WYC	Wycon Chemical Co	307-637-2700	P. O. Box 1287, Cheyenne, WY 82003.
WYT	Wyeth Laboratories, Inc., Wyeth Laboratories Div. of American Home Products Corp	215-341-3867	P.O. Box 13745, Philadelphia, PA 19101-3745.

Source: Compiled from data received in response to questionnaires of the U.S. International Trade Commission.

APPENDIX B
CYCLIC INTERMEDIATES;
GLOSSARY OF SYNONYMOUS NAMES

Table B-1

Cyclic Intermediates: Glossary of synonymous names

Common name	*Standard (chemical abstracts) name*
A acid	3,5-Dihydroxy-2,7-naphthalenedisulfonic acid.
Acetyl-p-phenylenediamine	4'-Aminoacetanilide.
1,2,4-acid	4-Amino-3-hydroxy-1-naphthalenesulfonic acid (1-Amino-2-naphthol-4-sulfonic acid).
Acid yellow 9	6-Amino-3,4'-azodibenzenesulfonic acid.
p-Aminobenzenesulfonic acid	Sulfanilic acid and salt.
m-Aminobenzoyl J acid	4-Hydroxy-7-(m-aminobenzamido)-2-naphthalenesulfonic acid.
Aminoepsilon acid	8-Amino-1,6-naphthalenedisulfonic acid.
Amino G acid	7-Amino-1,3-naphthalenedisulfonic acid.
Amino J acid	6-Amino-1,3-naphthalenedisulfonic acid.
Amino R salt	3-Amino-2,7-naphthalenedisulfonic acid.
Aniline oil	Aniline.
Anthraflavic acid	2,6-Dihydroxyanthraquinone.
Anthrarufin	1,5-Dihydroxyanthraquinone.
Armstrong & Wynne's acid	4-Hydroxy-2-naphthalenesulfonic acid.
B acid	5-Amino-4-hydroxy-1,7-naphthalenedisulfonic acid.
2B acid	6-Amino-4-chloro-m-toluenesulfonic acid.
4B acid	6-Amino-m-toluenesulfonic acid.
Benzal chloride	α,α-Dichlorotoluene.
Benzanthrone	7H-Benz[de]anthracen-7-one.
Benzotrichloride	α,α,α-Trichlorotoluene.
Bisphenol A	4,4'-Isopropylidenediphenol.
B.O.N.	3-Hydroxy-2-naphthoic acid.
Broenner's acid	6-Amino-2-naphthalenesulfonic acid.
Bromamine acid	1-Amino-4-bromo-2-anthraquinonesulfonic acid.
Bromobenzanthrone	3-Bromo-7H-benz[de]anthracen-7-one.
C acid	3-Amino-1,5-naphthalenedisulfonic acid.
C.A. acid	3-Amino-6-chloro-4-sulfobenzoic acid.
C-Amine (Lake Red C acid)	2-Amino-5-chloro-p-toluenesulfonic acid.
Cassella acid	5-Hydroxy-1-naphthalenesulfonic acid.
Chicago Acid (SS acid	4-Amino-5-hydroxy-1,3-naphthalenedisulfonic acid.
Chlorobenzanthrone	Chloro-7H-benz[de]anthracen-7-one.
Chromotropic acid	4,5-Dihydroxy-2,7-naphthalenedisulfonic acid.
Chrysazin	1,8-Dihydroxyanthraquinone.
1,6-Cleve's acid	5-Amino-2-naphthalenesulfonic acid.
1,7-Cleve's acid	8-Amino-2-naphthalenesulfonic acid.
Crocein acid	7-Hydroxy-1-naphthalenesulfonic acid.
2-Cyanopyridine	Picolinonitrile.
3-Cyanopyridine	Nicotinonitrile.
Cyanuric chloride	2,4,6-Trichloro-s-triazine.
D acid	6-Amino-1-naphthalenesulfonic acid.
DADI	Dianisidine diisocyanate.
DDB	p-Dibutoxybenzene.
Decacyclene	Diacenaphtho[1,2-j:1',2'-l]fluoranthene.
Dehydrothio-p-toluidine	2-(p-Aminophenyl)-6-methylbenzothiazole.
Developer Z	3-Methyl-1-phenyl-2-pyrazolin-5-one.
o-Dianisidine	3,3'-Dimethoxybenzidine.
1,1'-Dianthrimide	1,1'-Iminodianthraquinone.
Dibenzanthrone	Violanthrone.
Dichlone	2,3-Dichloro-1,4-naphthoquinone.
4,4'-Dihydrocydiphenylsulfone	4,4'-Sulfonyldiphenol.
Dimethyl POPO	1,4-Bis[2-(4-methyl-5-phenyloxazolyl)]benzene.
4,5-Dinitrochrysazin	1,8-Dihydroxy-4,5-dinitroanthraquinone.
Dioxy S acid	4,5-Dihydroxy-1-naphthalenesulfonic acid.
Diphenyl epsilon acl	6,8-Dianilino-1-naphthalenesulfonic acid.
Durene	1,2,4,5-Tetramethylbenzene.
Epsilon acid (Andresen's acid)	8-Hydroxy-1,6-naphthalenedisulfonic acid.
F acid	7-Hydroxy-2-naphthalenesulfonic acid.
Fast Red G base	2-Nitro-p-toluidine [NH_2=1].
Fast Scarlet R base	5-Nitro-o-anisidine [NH_2=1].
Fischer's aldehyde	1,3,3-Trimethyl-ω^2,α-indolineacetaldehyde.
Fischer's base	1,3,3-Trimethyl-2-methyleneindoline.
Freund's acid	4-Amino-2,7-naphthalenedisulfonic acid.

Table B-1—Continued

Cyclic Intermediates: Glossary of synonymous names

Common name	*Standard (chemical abstracts) name*
G salt	7-Hydroxy-1,3-naphthalenesulfonic acid, sodium salt.
Gamma acid	6-Amino-4-hydroxy-2-naphthalenesulfonic acid, sodium salt.
Gold salt	9,10-Dihydro-9,10-dioxo-1-anthracenesulfonic acid and salt.
H acid	4-Amino-5-hydroxy-2,7-naphthalenedisulfonic acid, (8-Amino-1-naphthol-3,6-disulfonic acid).
Hellimellitene	1,2,3-Trimethylbenzene.
Indoxyl	3(2H)-Indolone.
Isodurene	1,2,3,5-Tetramethylbenzene.
J acid	7-Amino-4-hydroxy-2-naphthalenesulfonic acid, sodium salt.
J acid urea	7,7'-Ureylenebis[4-hydroxy-2-naphthalenesulfonic acid]
K acid	4-Amino-5-hydroxy-1,7-naphthalenedisulfonic acid.
Koch's acid	8-Amino-1,3,6-naphthalenetrisulfonic acid.
L acid	5-Hydroxy-1-naphthalenesulfonic acid.
Lake Red C amine	2-Amino-5-chloro-p-toluenesulfonic acid.
Laurent's acid	5-Amino-1-naphthalenesulfonic acid.
M acid	8-Amino-4-hydroxy-2-naphthalenesulfonic acid.
MEP	5-Ethyl-2-picoline (2-Methyl-5-ethylpyridine).
Mesitylene	1,3,5-Trimethylbenzene.
Methane base	4,4'-Methylenebis[N,N-dimethylaniline].
Michler's hydrol	4,4'-Bis[dimethylamino]benzhydrol.
Michler's ketone	4,4'-Bis[dimethylamino]benzophenone.
MOCA	3,3'Dichloro-4,4'-diaminodiphenylmethane.
MVP	5-Vinyl-2-picoline.
Naphthionic acid	4-Amino-1-naphthalenesulfonic acid.
o-Naphthionic acid	1-Amino-2-naphthalenesulfonic acid.
β-Naphthol	2-Naphthol, tech
Naphthol AS	3-Hydroxy-2-naphthanilide.
α-Napthylamine	1-Naphthylamine.
Neville & Winther's acid	4-Hydroxy-1-naphthalenesulfonic acid.
m-Nitrobenzoyl J acid	4-Hydroxy-7-(m-nitrobenzamido)-2-naphthalenesulfonic acid.
Oxy Koch's acid	1-Naphthol-3,6,8-trisulfonic acid.
Pentaanthrimide	1,4,5,8-Tetrakis(1-anthraquinonylamino)anthraquinone.
Peri acid	8-Amino-1-naphthalenesulfonic acid.
Phenylbiphenyl	Terphenyl.
N-Phenyldiethanolamine	2,2'-[(Phenyl)imino]diethanol.
Phenyl gamma acid	6-Anilino-4-hydroxy-2-naphthalenesulfonic acid.
Phenyl J acid	7-Anilino-4-hydroxy-2-naphthalenesulfonic acid.
Phenyl peri acid	8-Anilino-1-naphthalenesulfonic acid.
Picric acid	2,4,6-Trinitrophenol.
POPO	1,4-Bis[2-(5-phenyloxazolyl)]benzene.
Pseudocumene	1,2,4-Trimethylbenzene.
Pyrazoleanthrone	Anthra[1,9-cd]pyrazol-6(2H)-one.
Pyrazoleanthrone yellow	[3,3'-Bianthral[1,9-cd]pyrazole]-6,6'-(2H,2'H)dione.
Pyrazolone T	5-Oxo-1-(p-sulfophenyl)-2-pyrazoline-3-carboxylic acid.
Quinizarin	1,4-Dihydroxyanthraquinone.
2-Quinizarinsulfonic acid	9,10-Dihydro-1,4-dihydroxy-9,10-dioxo-2-anthracenesulfonic acid.
Quinoline yellow base	Quinophthalone.
R salt	3-Hydroxy-2,7-naphthalenedisulfonic acid, disodium salt.
RG acid (Violet acid)	4-Hydroxy-2,7-naphthalenedisulfonic acid.
Rhoduline acid (J Acid Imide)	7,7'-Iminobis[4-hydroxy-2-naphthalenesulfonic acid].
RR acid	3-Amino-5-hydroxy-2,7-naphthalenedisulfonic acid.
S acid	4-Amino-5-hydroxy-1-naphthalenesulfonic acid.
Schaffer's acid	6-Hydroxy-2-naphthalenesulfonic acid.
Silver salt	9,10-Dihydro-9,10-dioxo-2-anthrazenesulfonic acid and salt.
Solvent Yellow 1	p-Phenylazoaniline and hydrochloride.
Solvent Yellow 3	4-(o-Tolylazo)-o-toluidine.
SS acid (Chicago acid)	4-Amino-5-hydroxy-1,3-naphthalenedisulfonic acid.
Sulfanilic acid	p-Aminobenzenesulfonic acid.
o-Sulfobenzaldehyde	o-Formylbenzenesulfonic acid.

Table B-1—Continued

Cyclic Intermediates: Glossary of synonymous names

Common name	*Standard (chemical abstracts) name*
Tetralin	1,2,3,4-Tetrahydronaphthalene.
Thioindoxyl	3(2H)-Thianaphthenone.
Thiosalicylic acid	o-Mercaptobenzoic acid.
Tobias acid	2-Amino-1-naphthalenesulfonic acid.
TODI	Bitolylene diisocyanate.
o-Tolidine	3,3'-Dimethylbenzidine.
α-Toluic acid	Phenylacetic acid.
α-Tolunitrile	Phenylacetonitrile.
4-m-Tolylenediamine	Toluene-2,4-diamine.
Trimellitic anhydride	1,2,4-Benzenetricarboxylic acid, 1,2-anhydride.
Trimethyl base	1,3,3-Trimethyl-2-methyleneindoline.
Trinitrophenol	Picric acid.
Urea J acid (J acid urea)	7,7'-Ureylenebis[4-hydroxy-2-naphthalenesulfonic acid].
Veratraldehyde	3,4-Dimethoxybenzaldehyde.
Veratrole	o-Dimethoxybenzene.
Vinyltoluene	ar-Methylstyrene.
Violet acid (RG acid)	4-Hydroxy-2,7-naphthalenedisulfonic acid.

APPENDIX C
SYNTHETIC ORGANIC CHEMICALS, U.S. PRODUCTION AND SALES, 1988

Synthetic Organic Chemicals, U.S. Production And Sales, 1988, Harmonized System Basis

The following table contains 1988 U.S. production and sales data for synthetic organic chemicals in the 6-digit Harmonized System (HS) format. The Commission decided to compile such data in this format in response to the decision by the U.S. Bureau of the Census to publish Standard Industrial Classification (SIC) data which will be convertible to the HS beginning with the 1987 *Census of Manufactures*. The U.S. Bureau of the Census has historically referred to the *Synthetic Organic Chemicals, United States Production and Sales (SOC)* report in the chemicals section of the *Census of Manufactures,* which permits them to omit collecting synthetic organic chemicals production and shipments data from its respondents. Because of this situation, the SOC data will now also be compiled on an HS basis to provide comparablility with the new SIC format.

The table provides production and sales data on a 6-digit HS basis only where publication would not violate the statutory provisions relating to unlawful disclosure of information accepted in confidence by the Commission. It includes only the 6-digit item numbers with publishable data from a number of HS chapters in which these chemicals are classified, but does not provide totals by chapter or overall total figures.

Table C-1
Synthetic organic chemicals: U.S. production and sales, 1988, harmonized system basis

HS/ number	Description	Production Quantity	Sales Quantity	Sales Value
		Pounds	Pounds	Dollars
151800	Chemically modified fats and oils and their fractions (except those of heading 1516)	138,654,439	134,465,792	72,824,127
220720	Ethyl alcohol and other spirits, denatured, of any strength	561,777,818	437,697,370	133,672,997
290121	Ethylene	37,203,907,797	14,553,625,014	3,690,038,268
290122	Propene (Propylene)	21,223,882,459	13,356,175,552	2,196,937,319
290124	Buta-1,3-diene and isoprene	3,536,528,693	3,158,886,783	676,894,985
290211	Cyclohexane	2,296,732,194	2,129,326,194	404,722,520
290250	Styrene	8,986,054,509	3,784,920,168	1,622,714,971
290260	Ethylbenzene	21,720,625,678	253,017,233	73,117,745
290270	Cumene	4,454,525,312	2,792,735,171	531,368,624
290311	Chloromethane (Methyl chloride) and chloroethane (Ethyl chloride)	748,923,217	312,163,128	54,620,970
290312	Dichloromethane (Methylene chloride)	504,118,999	515,717,680	91,236,373
290319	Other saturated chlorinated derivs of acyclic hydrocarbons nspf	1,514,606,774	1,486,712,986	368,129,130
290321	Vinyl chloride (Chloroethylene)	9,057,557,198	3,951,461,680	910,800,056
290329	Other unsaturated chlorinated derivs of acyclic hydrocarbons nspf	.....	129,592,000	63,881,663
290340	Halogenated derivs of acyclic hydrocarbons containing two or more different halogens	1,281,458,839	1,095,201,919	824,904,092
290410	Hydrocarbon derivs containing only sulfo groups, their salts and ethyl esters	1,108,503,696	389,690,188	189,463,412
290511	Methanol (Methyl alcohol)	8,142,388,050	3,690,341,898	267,879,899
290512	Propan-1-ol (Propyl alcohol) and propan-2-ol (Isopropyl alcohol)	1,604,551,018	1,235,336,697	244,268,472
290513	Butan-1-ol (n-Butyl alcohol)	1,854,125,841	576,523,078	146,453,235
290514	Other butanols nspf	1,403,171,921	184,023,942	42,306,356
290531	Ethylene glycol (Ethanediol)	5,517,250,226	4,406,674,907	1,442,932,615
290532	Propylene glycol (Propane-1,2-diol)	840,460,300	742,898,740	211,714,780
290539	Other acyclic diols, nspf	2,678,665,769	1,886,563,284	1,051,749,684
290542	Pentaerythritol	122,190,521	109,759,170	63,726,376
290549	Other acyclic polyhydric alcohols, nspf	1,068,457,077	1,047,477,545	82,401,308
290550	Halogenated, sulfonated, nitrated or nitrosated derivs of acyclic alcohols	.....	7,174,577	11,374,858
290711	Phenol (Hydroxybenzene) and its salts	3,561,310,625	1,575,111,167	599,678,442
290723	4,4'-Isopropylidenediphenol (Bisphenol A, Diphenylolpropane) and its salts	1,340,167,118	422,221,000	230,301,000
290919	Other acyclic ethers, and their halo, sulfo, nitro or nitroso derivs	5,042,974,084	4,599,970,116	1,190,299,740
290941	2,2'-Oxydiethanol (Diethylene glycol, Digol)	563,032,621	464,241,634	166,318,175
290942	Monomethyl ethers of ethylene glycol or of diethylene glycol	89,284,563	81,435,212	34,812,880
290943	Monobutyl ethers of ethylene glycol or of diethylene glycol	391,528,767	350,531,036	139,840,785
290949	Other ether-alcohols and their halo, sulfo, nitro or nitroso derivs nspf	595,080,739	504,691,565	303,663,046
290960	Alcohol-, ether- and ketone peroxides and their halo, sulfo, nitro or nitroso derivs	86,840,728	48,838,030	56,660,744
291010	Oxirane (Ethylene oxide)	5,952,699,341	647,723,371	247,067,071
291211	Methanal (Formaldehyde)	6,280,451,587	1,691,683,070	144,045,994
291213	Butanal (Butyraldehyde, normal isomer)	1,775,674,320	59,852,650	11,724,279
291230	Aldehyde-alcohols	4,204,829	2,260,084	13,056,388
201411	Acetone	2,302,846,617	1,526,583,166	241,679,664
291412	Butanone (Methyl ethyl ketone)	482,027,800	424,337,380	166,627,546
291413	4-Methylpentan-2-one (Methyl isobutyl ketone)	205,312,587	158,713,847	59,546,940
291422	Cyclohexanone and methylcyclohexanones	1,057,281,430	157,001,669	75,462,556
291423	Ionones and methylionones	1,404,245	947,593	8,878,920
291430	Aromatic ketones without other oxygen function	4,993,047	.....	.....
291521	Acetic acid	3,159,457,529	783,753,019	131,912,527
291522	Sodium acetate	49,178,184	.....	.....
291531	Ethyl acetate	254,348,403	191,302,922	59,323,731

Table C-1—Continued
Synthetic organic chemicals: U.S. production and sales, 1988, harmonized system basis

HS/ number	Description	Production Quantity	Sales Quantity	Sales Value
		Pounds	Pounds	Dollars
291532	Vinyl acetate	2,561,433,647	1,184,161,902	439,093,727
291533	n-Butyl acetate	192,845,313	159,826,736	59,242,439
291534	Isobutyl acetate	83,418,847	55,435,717	17,849,794
291539	Other esters of acetic acid nspf	230,256,928	198,530,309	129,157,818
291570	Palmitic acid, stearic acid, their salts and esters	242,043,587	220,024,874	159,306,365
291590	Other saturated acyc monocarboxylic acids, their anhydrides, halides, peroxides, peroxy-acids; halo, sulfo, nitro, nitroso derivs nspf	882,424,122	347,132,133	235,499,751
291615	Oleic, linoleic or linolenic acids, their salts and esters	121,102,512	.....	.....
291619	Other unsaturated acyc monocarboxylic acids, their anhydrides, halides, peroxides, peroxyacids nspf; halo, sulfo, nitro, nitroso deriv	81,733,450	104,829,291	48,699,825
291620	Cyclanic, cyclenic or cycloterpenic monocarboxylic acids, their anhydrides, halides, peroxides, peroxyacids and their derivs	89,681,838	80,640,888	121,568,856
291631	Benzoic acid, its salts and esters	151,955,205	90,939,518	44,669,979
291639	Other aromatic monocarboxylic acids, their anhydrides halides, peroxides, peroxyacids and their derivs nspf	42,777,574	36,642,143	148,687,502
291719	Other acyc. polycarboxylic acids, their anhydrides, halides, peroxides, peroxyacids nspf; halo, sulfo, nitro or nitroso derivs	646,140,652	495,873,922	288,026,174
291732	Dioctyl orthophthalates	344,267,839	352,576,046	141,617,490
291735	Phthalic anhydride	998,514,730	575,017,690	167,669,299
291739	Other aromatic polycarboxylic acids, their anhydrides halides, peroxides, peroxyacids nspf and their derivs	4,589,427,585	1,433,876,628	554,696,986
291819	Other carbox. acids w/add alcohol function only, anhydrides, halides, peroxides, peroxyacids nspf; halo, sulfo, nitro, nitroso derivs	23,667,124	29,831,418	27,957,208
291822	O-Acetylsalicylic acid (Aspirin), its salts and esters	23,693,107	.....	.....
291829	Other carboxylic acids w/add phenol funct only, anhydrides, halides, peroxides, peroxyacids nspf; halo, sulfo, nitro, nitroso derivs	4,415,032	4,140,368	13,265,898
291830	Other carboxylic acids with add aldehyde or ketone function only, anhydrides, halides, peroxides, peroxyacids nspf; halo, etc. derivs	964,575,563	.....	.....
291890	Other carboxylic acids w/add oxygen function, anhydrides, halides, peroxides, peroyacids nspf; halosulfo, nitro, nitroso derivs	117,613,553	90,048,567	179,994,596
291900	Phosphoric esters and their salts, incl. lactophosphates; their halo, sulfo, nitro, nitroso derivs	162,681,638	137,582,273	150,482,772
292010	Thiophosphoric esters (phosphorothioates), their salts; their halo, sulfo, nitro, nitroso derivs	108,430,036	78,815,367	155,142,372
292090	Other esters of inorg. acids (excl. esters of hydrogen halides) nspf, their salts; halo, sulfo, nitro, nitroso derivs	226,889,100	145,370,549	141,424,118
292119	Other acyclic monoamines and their derivs nspf; salts thereof	270,599,316	241,903,075	164,950,145
292129	Other acyclic polyamines and their derivs nspf; salts thereof	170,218,922	133,978,622	138,525,594
292130	Cyclanic, cyclenic, cycloterpenic mono- or polyaminesand their derivs; salts thereof	37,847,022	34,589,160	51,170,722
292141	Aniline and its salts	1,029,188,988	677,900,181	182,154,277
292211	Monoethanolamine and its salt	208,113,809	138,032,210	54,142,321
292212	Diethanolamine and its salts	184,588,355	153,107,300	59,453,398
292213	Triethanolamine and its salts	212,572,379	185,065,236	79,348,418
292219	Other amino-alcohols nspf, their ethers and esters, containing only one kind of oxygen function; salts thereo	120,895,104	100,196,524	118,411,147
292229	Other amino-naphthols and amino-phenols nspf, theirethers, esters, containing only one kind of oxygen function; salts thereof	11,801,099	.....	.....

Table C-1—Continued
Synthetic organic chemicals: U.S. production and sales, 1988, harmonized system basis

HSI number	Description	Production Quantity	Sales Quantity	Sales Value
		Pounds	Pounds	Dollars
292230	Amino-aldehydes, amino-ketones and amino-quinones, containing only one kind of oxygen function; salts thereof	169,775	.....	.....
292249	Other amino-acids nspf and their esters, containing only one kind of oxygen function; salts thereof	100,258,929	71,276,002	106,126,366
292250	Amino-alcohol-phenols, amino-acid-phenols and other amino-compounds with oxygen function	62,884,927	22,837,303	62,270,504
292390	Other quaternary ammonium salts and hydroxides nspf	62,056,091	47,599,838	59,336,616
292421	Ureines and their derivs; salts thereof	36,009,978	28,450,397	98,118,634
292519	Other imides nspf and their derivs; salts thereof	10,990,011	8,248,198	25,523,443
292520	Imines and their derivs; salts thereof	202,457,143	147,451,138	113,118,077
292690	Other nitrile-function compounds nspf	5,082,767,837	1,860,319,319	872,778,247
292700	Diazo-, azo-, or azoxy-compounds	.....	16,774,840	62,838,749
292800	Organic derivs of hydrazine or of hydroxylamine	1,304,498	.....	.....
292910	Isocyanates	1,764,651,758	1,471,400,708	1,306,770,212
292990	Other compounds nspf with other nitrogen functions	157,896,878	51,169,468	38,641,971
293020	Thiocarbamates and dithiocarbamates	102,951,611	85,786,604	187,239,586
293090	Other organo-sulfur compounds nspf	832,189,269	365,301,614	403,898,318
293100	Other organo-inorganic compounds	591,499,766	178,382,395	1,053,198,175
293211	Tetrahydrofuran	93,804,295	.....	.....
293229	Other lactones nspf with oxygen hetero-atom(s) only	112,503,862	24,675,210	78,650,783
293339	Other heterocyclic cmpds with nitrogen hetero-atom(s) only nspf, with unfused pyridine ring (hydrogenatedor not) in structure	115,595,121	86,138,883	573,390,015
293359	Heterocyc cmpds w/nitrogen hetero-atom(s) only, pyrimidine (hydrogenated or not) or piperazine ring in struct; nucleic acids, salts	29,937,475	17,096,245	100,869,251
293369	Other heterocyc cmpds w/nitrogen hetero-atom(s) only nspf, with unfused triazine ring (hydrogenated or not) in the structure	404,063,138	190,688,043	524,208,636
293371	6-Hexanelactam (epsilon-Caprolactam)	1,261,264,500	367,583,340	234,494,953
293390	Other heterocyclic compounds with nitrogen hetero atom(s) only nspf	561,253,991	618,025,346	269,867,446
293420	Heterocyclic compounds containing a benzothiazole ring-system (hydrogenated or not), not further fused	107,953,125	62,866,761	149,896,229
293490	Other heterocyclic compounds nspf	113,401,867	69,976,347	293,754,819
320411	Disperse dyes and preparations based thereon	30,064,000	21,874,000	99,689,000
320412	Acid dyes, premetallized or not, mordant dyes and preparations based thereon	17,779,000	15,372,000	75,338,000
320413	Basic dyes and preparations based thereon	13,846,000	12,591,000	72,575,000
320414	Direct dyes and preparations based thereon	41,616,000	40,053,000	98,134,000
320419	Other synth. organic coloring matter nspf and preparations based thereon, incl mixtures of items of subheadings 3204.11 thru 3204.19	49,501,018	42,111,274	152,112,750
320420	Fluorescent brightening agents	77,381,000	69,813,000	102,062,000
380610	Rosin	167,195,752	135,165,799	49,516,785
380630	Ester gums	157,895,911	151,253,469	107,533,524
381230	Antioxidizing preps and compound stabilizers for rubber or plastics	50,499,813	37,183,412	59,171,524
381590	Reaction initiators, reaction accelerators, and catalytic preps, nspf	76,766,375	15,056,807	36,710,873
390110	Polyethylene having a specific gravity of less than 0.94	9,779,232,283	9,013,356,207	4,461,043,828
390120	Polyethylene having a specific gravity of 0.94 or more	8,915,094,805	8,681,505,152	4,084,365,735
390210	Polypropylene	7,256,768,000	5,896,665,000	2,819,374,000
390311	Polystyrene, expandable	551,150,393	554,639,629	370,750,263
390319	Polystyrene, other than expandable	5,245,970,156	4,206,629,410	2,511,599,002

Table C-1—Continued
Synthetic organic chemicals: U.S. production and sales, 1988, harmonized system basis

HSI number	Description	Production Quantity	Sales Quantity	Sales Value
		Pounds	Pounds	Dollars
390330	Acrylonitrile-butadiene-styrene (ABS) copolymers	1,929,284,427	1,860,178,304	1,713,024,939
390390	Other polymers of styrene nspf, in primary forms	1,218,465,735	1,051,787,934	1,328,218,368
390410	Polyvinl chloride, not mixed with any other substances	8,588,205,000	7,798,405,000	3,224,604,000
390461	Polytetrafluoroethylene (PTFE)	18,095,300	24,604,289	141,645,097
390511	Polymers of vinyl acetate in aqueous dispersion	675,099,114	650,203,029	355,506,001
390590	Polymers of vinyl esters nspf, in primary forms; other vinyl polymers nspf, in primary forms	788,170,000	672,227,841	466,754,223
390730	Epoxide resins	943,506,512	690,129,633	799,388,805
390750	Alkyd resins	760,215,721	505,122,657	297,306,357
390791	Other polyesters nspf, unsaturated, in primary forms	1,526,896,732	1,451,234,521	873,099,482
390799	Other polyesters nspf, saturated, in primary forms	734,084,628	588,313,268	724,854,920
390810	Polyamide-6, -11, -12, -6,6, -6,9, -6,10 or -6,12 (nylon type)	3,031,086,000	.....	.....
390910	Urea resins; thiourea resins	2,501,953,000	2,193,507,427	249,766,561
390920	Melamine resins	252,628,000	214,052,000	192,428,000
390940	Phenolic resins	1,681,318,000	1,163,568,000	773,490,000
390950	Polyurethanes	273,029,216	204,071,591	324,167,764

APPENDIX D
ALPHABETICAL CHEMICAL INDEX

Alphabetical Chemical Index

The alphabetical index of chemicals contained in this appendix table is an outgrowth of the processing of data by the U.S. International Trade Commission for its annual report, *Synthetic Organic Chemicals, United States Production and Sales*. This index will aid those who have an interest in the report, either as users of the published data or as suppliers of individual company data to the Commission, principally by showing the section number and line item number of specific chemicals. This information can be used to assist in locating a chemical in the report and to provide respondents to the Commission's questionnaire with information on where to list their production and sales data. The index shows only those chemicals for which production or sales were reported to the Commission for this edition of the report.

The index, initially designed for Commission use in computer processing of data for the annual report, has certain characteristics that should be noted to increase its usefulness. For example, superior headings for individual entries are not shown in the index. Thus, understanding the contents of the first item in the index, "accelerators, activators, and vulcanizing agents, acyclic, *other*," necessitates that the index user turn to the individual section (in the report) and item number (in the questionnaire) to find those acyclic accelerators, activators, and vulcanizing agents already specified. Similarly, the index entry "specific gravity 0.940 and below" does not by itself identify the chemical product. The index user will need to turn to the indicated section number and item number to determine the chemical referred to—in this case, polyethylene.

The chemical names used in this report and in the questionnaires sent to U.S. producers to obtain the data aggregated in the report are listed alphabetically in the first column of each listing in the index. The second column refers to the section in the report and questionnaire containing the chemical, and the third column shows the appropriate item number in that section in the questionnaire.

Table D-1
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
Accelerators, activators, and vulcanizing agents, acyclic, other	09	163.000
Accelerators, activators, and vulcanizing agents, cyclic, other	09	49.000
Acetaldehyde	15	782.000
Acetaldehyde dimethylhydrazone	15	307.200
Acetaldehyde ethyl phenethyl acetal	07	1.300
Acetaldehyde phenethyl propyl acetal	07	1.400
Acetal resins	08	19.000
Acetamide	15	227.000
Acetaminophen	06	392.000
Acetic acid, amides with polyalkylene polyamines, salt	12	357.900
Acetic acid, synthetic (100%)	15	486.000
Acetic anhydride from acetic acid, other than recovered, by the vapor-phase process (100%)	15	488.000
Acetic anhydride from acetic acid, recovered, by vapor-phase process	15	489.000
Acetoacetanilide	03	9.000
o-Acetoacetanisidide	03	10.000
Acetoacetarylide yellows, all others	05	7.000
o-Acetoacetotoluidide	03	11.000
2',4'-Acetoacetoxylidide	03	11.500
Acetoacet-m-xylidide	03	11.513
Acetoguanamine	03	115.200
Acetohexamide	06	686.000
1'-Acetonaphthone	03	12.000
2'-Acetonaphthone (β-Methyl naphthyl ketone)	07	1.500
Acetone, crude	15	809.000
Acetone from cumene	15	806.000
Acetone-formaldehyde resins	08	1.000
Acetone from isopropyl alcohol	15	807.000
Acetonitrile	15	432.000
3-(α-Acetonylbenzyl)-4-hydroxycoumarin (Warfarin)	13	169.000
Acetophenone, tech.	03	14.000
p-Acetotoluidide	03	15.000
1-Acetoxy-2-sec-butyl-1-ethenylcyclohexane	07	93.500
6-Acetoxy-2,4-dimethyl-1,3-dioxane	15	1.000
Acetylacetonates, all other	15	1281.700
Acetylacetone peroxide	15	1281.990
N-(Acetylamino)methyl-2-chloro-N-(2,6-diethylphenyl) acetamide	13	168.995
Acetyl-n-butyryl (2,3-Hexanedione)	07	126.100
Acetyl cedrene (Vertoflex)	07	93.550
Acetyl chloride	15	490.500
Acetylcholine chloride	06	612.001
Acetylene (For chemical use only)	02	38.000
Acetyl isovaleryl (5-Methyl-2,3-hexanedione)	07	126.500
N-Acetyl methyl anthranilate	07	93.555
Acetyl propionyl (2,3-Pentanedione)	07	126.600
2-Acetylpyridine	03	19.450
Acid Black 1	04	203.000
Acid Black 2	04	204.000
Acid Black 52	04	211.000
Acid Black 60	04	214.000
Acid Black 63	04	214.063
Acid Black 107	04	216.000
Acid Black 172	04	218.172
Acid Black 194	04	218.194
Acid black 210	04	218.210
Acid black dyes, all other	04	219.000
Acid Blue 9	04	132.000
Acid Blue 15	04	133.000
Acid Blue 25	04	136.000
Acid Blue 40	04	140.000
Acid Blue 41	04	141.000
Acid Blue 67	04	145.067
Acid Blue 92	04	153.000
Acid Blue 113	04	157.000
Acid Blue 118	04	158.000
Acid Blue 145	04	161.000
Acid Blue 231	04	168.000
Acid Blue 283	04	168.283
Acid Blue 298	04	168.298
Acid Blue 321	04	168.321
Acid Blue 324	04	168.324
Acid Blue 330	04	168.330
Acid blue dyes, all other	04	169.000
Acid Brown 14	04	189.000
Acid Brown 19	04	190.000
Acid Brown 50	04	194.050
Acid Brown 96	04	195.000
Acid Brown 97	04	196.000
Acid Brown 98	04	197.000
Acid Brown 147	04	197.147
Acid Brown 159	04	199.159
Acid Brown 160	04	199.160
Acid Brown 161	04	199.161
Acid Brown 165	04	199.165
Acid Brown 188	04	199.188
Acid Brown 189	04	199.189
Acid Brown 227	04	200.227
Acid Brown 239	04	200.239
Acid Brown 264	04	200.264
Acid brown 439	04	200.439
Acid brown dyes, all other	04	202.000
Acid Green 1	04	170.000
Acid Green 5	04	172.000
Acid Green 9	04	173.000
Acid Green 20	04	177.000
Acid Green 25	04	179.000
Acid green dyes, all other	04	186.000
Acid Orange 7	04	43.000
Acid Orange 8	04	44.000
Acid Orange 10	04	45.000
Acid Orange 24	04	47.000
Acid Orange 60	04	54.000
Acid Orange 64	04	57.000
Acid Orange 89	04	61.089
Acid Orange 116	04	62.000
Acid Orange 128	04	64.000

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
Acid Orange 152	04	65.152
Acid Orange 156	04	65.156
Acid Orange 161	04	65.161
(Acid Red 26)	05	214.000
Acid Red 1	04	67.000
Acid Red 4	04	68.000
Acid Red 14	04	69.000
Acid Red 18	04	71.000
Acid Red 57	04	79.000
Acid Red 73	04	81.000
Acid Red 85	04	83.000
Acid Red 87	04	84.000
Acid Red 88	04	85.000
Acid Red 97	04	87.000
Acid Red 114	04	92.000
Acid Red 119	04	94.000
Acid Red 137	04	97.000
Acid Red 151	04	99.000
Acid Red 174	04	100.174
Acid Red 182	04	103.000
Acid Red 186	04	105.000
Acid Red 226	04	110.226
Acid Red 266	04	111.000
Acid Red 296	04	111.296
Acid Red 299	04	112.000
Acid Red 337	04	114.000
Acid Red 364	04	115.364
Acid Red 384	04	115.384
Acid Red 388	04	115.388
Acid Red 396	04	115.396
Acid Red 410	04	115.410
Acid red dyes, all other	04	116.000
Acids, acid anhydrides, and acyl halides, all other	15	586.000
Acid Violet 3	04	118.000
Acid Violet 7	04	119.000
Acid Violet 12	04	120.000
Acid Violet 17	04	121.000
Acid Violet 49	04	126.000
(Acid Yellow 23)	05	204.023
Acid Yellow 3	04	3.000
Acid Yellow 17	04	6.000
Acid Yellow 23	04	8.000
Acid Yellow 34	04	11.000
Acid Yellow 36	04	12.000
Acid Yellow 49	04	17.000
Acid Yellow 59	04	19.000
Acid Yellow 65	04	21.000
Acid Yellow 73	04	22.000
Acid Yellow 87	04	24.087
Acid Yellow 99	04	25.000
Acid Yellow 127	04	29.000
Acid Yellow 129	04	31.000
Acid Yellow 135	04	32.000
Acid Yellow 151	04	33.000
Acid Yellow 159	04	34.000
Acid Yellow 174	04	35.000
Acid Yellow 198	04	37.000
Acid Yellow 200	04	37.200
Acid Yellow 219	04	37.219
Acid Yellow 226	04	24.096
Acid Yellow 239	04	37.239
Acid yellow dyes, all other	04	38.000
Aclomethasone	06	648.100
Acrolein (Acrylaldehyde)	15	783.000
Acrylamide-2-acrylamido-2-methylpropanesulfonic acid, sodium salt polymer	14	395.000
Acrylamide-acrylic acid copolymer, potassium salt	14	397.500
Acrylamide-acrylic acid copolymer, sodium salt	14	397.000
Acrylamide N-dimethylaminomethylacrylamide copolymer	14	399.000
Acrylamide monomer	15	228.000
Acrylamide-trimethylaminoethyl acrylate chloride polymer	14	399.500
Acrylamide-trimethylaminoethyl methacrylate chloride	14	400.000
Acrylate-alkyd copolymer resins	08	1.900
Acrylic acid	15	491.000
Acrylic monomers, mixed	15	884.000
Acrylonitrile-butadiene-styrene (ABS) terpolymer resins	08	42.000
Acrylonitrile, monomer	15	433.000
Acyclic amphoteric surface-active agents, all other	12	19.000
Acyclic herbicides	13	212.000
Acyclic insecticides, all other	13	231.000
Acyclic peroxides, all other	15	1296.550
Acyclic plasticizers, all other	11	130.000
Acyclovir	06	186.800
Acylic elastomers, all other	10	22.000
Adamantane	03	1551.500
Adipic acid	15	492.000
Adipic acid, ammonium salt	15	613.000
Adipic acid-crosslinked polycrylamide	14	405.000
Adipic acid-diethylene triamine condensate	15	269.810
Adipic acid-diethylenetriamine-epichlorohydrin polymer	14	153.000
Adipic acid esters, all others	11	66.000
Adipic acid, sodium salt	15	613.400
Adipic acid type complex linear polyesters and polymeric plasticizers	11	131.100
Adipic dihydrazide	15	613.300
Adiponitrile	15	434.000
β-Alanine-N-(2-hydroxyethyl)-N-21-[[oxococoyl]amino] ethyl, sodium salt	12	447.800
Albumin	06	574.800
albuterol sulfate	06	323.000
C_{12}-C_{15} Alcohol esters of lactic acid	15	884.600
C_{12}-C_{15} Alcohol, ethoxylated, propoxylated and phosphated	12	76.150
Alcohol mixtures, other	15	883.400
Alcohol mixtures, C_{-11} or lower only	15	883.100
Alcohol mixtures, C_{-19} and C_{20} only	15	883.300
Alcohol mixtures, C_{-12} through C_{-18} only	15	883.200
Alcohols, monohydric, and their esters, C_8 and higher	15	1425.000
Alcohols and phenols, alkoxylated and phosphated or polyphosphated, all other	12	91.000
Alcohols, unmixed C_{11} or lower, all other	15	870.000
Aldadiene	03	21.400

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
Aldehyde and acetone-amine reaction products, cyclic, other	09	55.000
Aldehyde-amine reaction products, cyclic, other	09	8.000
Aldehydes, acyclic, all other	15	805.000
Aliphatic hydrocarbon sulfides	14	253.000
Alkanolamine condensates, all other	12	575.000
Alkene thiophosphonate	14	265.000
Alkenyl succinimide	14	245.000
3-Alkoxy-2-hydroxypropyl trimethyl ammonium chloride	13	245.021
Alkoxy triacryl titanate	12	51.500
Alkoyl phenol	08	1.905
Alkyd copolymers, all other	08	3.900
Alkylalcohol ethoxylated and carbonated, sodium salt	12	318.600
2-(C_{13}- Alkyl)-1-(C_{14-18} amidoethyl)(4,5-dimydro-3-methyl)imidazolinium, methyl sulfate	12	455.950
N-alkylamine bismethylenephosphonic acid	14	27.000
Alkyl C_{12}-C_{14} amine hydrochloride	15	307.950
t-Alkylamines, primary, mixed	15	292.900
N-alkylaminobismethylene phosphonic acid salts	14	28.000
Alkyl aromaticsall other	02	4.000
Alkylaryl-p-phenylenediamines	09	55.100
Alkylaryl phosphites mixed	09	84.800
Alkylbenzene straight-chain (Except dodecyl and tridecyl)	03	22.000
t-α-Alkylcarboxylic acid salts (Isocarboxylic acid salts), all other	15	672.000
Alkyl dimethyl amine oxide	12	423.200
Alkyl glycidyl ethers, C_{12}-C_{14}	15	1317.320
Alkyl glycidyl ethers, C_8-C_{10}	15	1317.300
Alkyl imidazoline	14	267.000
N-alkyl-1-naphthylmethyl Ammonium Chloride	13	245.023
3-(C_{12-15} alkyloxy)-1-propanamine	12	321.045
3-(C_{12-18} alkyloxy)-1-propanamine	12	321.050
N-(C_{12-18} alkyl)oxypropyl trimethylene diamine	12	321.065
Alkylphenol formaldehyde condensate, alkoxylated	15	3.450
Alkylphenol-formaldehyde condensates, alkoxylated, all other	12	726.000
Alkyl phenols	14	219.000
Alkylphenols, mixed	03	23.100
Alkylpyridines, mixed	03	23.350
Alkyl succinic anhydride	14	268.000
Alkyl terephthalamate	14	269.000
All other acyclic flavor and perfume materials	07	172.000
All other benzenoid or naphthalenoid chemicals	07	93.000
All other dyes	04	1215.000
All other octanoic acid esters	11	89.900
Allo-ocimene	07	126.800
Allopurinol	06	829.000
All other products from petroleum and natural gas, cyclic	02	36.000
All other succinic anhydride derivatives	15	165.950
All other terpenoid, hetercyclic, or alicyclic flavor and perfume chemicals	07	126.000
Allyl alcohol	15	840.000
Allylamines	15	258.000
p-Allylanisole	07	2.600
Allyl n-butyl trithiocarbonate	14	134.000
Allyl cyclohexyl propionate	07	93.560
4-Allyl-1,2-dimethoxybenzene (4-Allylveratrole)	07	4.000
Allyl disulfide	07	126.900
Allyl heptanoate	07	126.990
Allyl hexanoate	07	127.000
Allyl methacrylate	15	885.000
4-Allyl-2-methoxyphenol (Eugenol)	07	5.000
4-Allyl-2-methoxyphenol acetate (Eugenol acetate)	07	5.100
1-(Allyloxy)-2,3-epoxypropane (Allyl glycidyl ether)	15	1317.330
3-Allyloxy-2-hydroxypropane sulfonic acid, sodium salt	15	614.300
Allyl resins	08	4.000
Allyl sulfonate, sodium salt	12	209.500
Alpha olefins, C_6-C_{10}	02	60.100
Alpha olefins, C_{11} and higher	02	62.100
Aluminum acetate	15	587.000
Aluminum acetylacetonate complex	15	1355.200
Aluminum chlorohydroxyphthalocyanine blue	03	23.400
Aluminum diisopropoxide acetoacetic ester chelate	15	1355.580
Aluminum distearate	15	746.000
Aluminum 2-ethylhexanoate	15	629.000
Aluminum ethyl-3-oxobutanoato-0^1,0^3-dihydroxy T-4	15	1355.600
Aluminum isooctoxide, diisopropoxide	15	1355.630
Aluminum isopropoxide (Aluminum isopropylate)	15	1355.650
Aluminum monostearate	15	747.000
Aluminum octanoate	15	713.000
Aluminum phenolsulfonate	06	552.000
Aluminum tri-sec-butoxide	15	1355.750
Aluminum tristearate	15	748.000
Amantadine hydrochloride	06	188.000
Amides, all other	15	257.000
Amidoamines	15	228.350
Amido amine salts as curing agents	15	228.300
Amiloride hydrochloride	06	736.500
Amine oxides and oxygen-containing amines (Except those with amide linkages), acyclic, all other	12	341.000
Amine oxides and oxygen-containing amines (Except those having amine linkages), cyclic, all other	12	357.000
Amines, all other	15	307.000
Amine salts (not containing oxygen), all other	12	403.000
Amine salts of fatty, rosin, and tall oil acids, all other	12	35.000
4'-Aminoacetanilide (Acetyl-p-phenylenediamine)	03	27.000
3'-Amino-p-acetanisidide	03	27.100
Amino acids and salts, cyclic, all other	14	23.000
3-Amino-p-anisanilide	03	35.000
1-Aminoanthraquinone and salt	03	37.000
p-Aminobenzamide	03	45.100
1-Amino-4-benzamidoanthraquinone	03	46.000
3'-Aminobenzanilide	03	50.500
o-Aminobenzenethiol	03	53.000
p-Aminobenzoic acid, tech.	03	56.000
2-Amino-6-benzothiazolesulfonic acid	03	58.090
2-Amino-1-bromo-3-chloroanthraquinone	03	59.000
1-Amino-4-bromo-9,10-dihydro-9,10-dioxo-2-anthracenesulfonic acid and sodium salt	03	61.000
7-Aminocephalosporanic acid	03	64.500

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
2-Amino-5-chloro-4-ethylbenzene	03	76.000
2-Amino-5-chloropyridine	03	81.500
6-Amino-5-chloro-m-toluenesulfonic acid [SO³H=1] (2B Acid)	03	83.000
6-Amino-2,4-dichloro-3-methylphenol	03	85.400
4-Amino-N,N-di(β-hydroxyethyl)aniline sulfate	03	91.503
Amino dimethyl butyronitrile	15	434.400
4-Amino-6-(1,1-dimethylethyl)-3-(methylthio)-1,2,4-triazin-5-(4H)-one	13	40.600
2-Aminoethanol hydrochloride	15	309.900
2-Aminoethanol (Monoethanol amine) sulfite	15	310.000
Aminoethoxyethanol	15	311.000
2-(2-Aminoethylamino)ethanol (Aminoethylethanolamine)	15	312.000
(2-Aminoethyl)amino]ethanol, reaction product with octadecanoic acid	15	312.500
N-Aminoethylaminopropyl trimethoxysilane	15	1378.450
(2-Aminoethyl)ethyl(hydrogenated tallow alkyl)(2-hydroxyethyl)ammonium ethyl sulfate	12	448.000
2-Aminoethyl mercaptoacetate (Monoethanolamine thioglycolate)	15	313.000
1-(2-Aminoethyl)-2-naphthenyl-2-imidazoline	12	404.450
1-(2-Aminoethyl)-2-nor(tall oil alkyl)-2-imidazoline	12	406.000
1-(2-Aminoethyl)piperazine	15	4.000
1-(2-Aminoethyl)piperazine, technical	15	5.000
2-Amino-2-ethyl-1,3-propanediol	15	314.000
N-2-(4-Amino-N-ethyl-m-toluidino)ethyl methanesulfonamide	14	318.000
Aminoguanidine hydrochloride	15	315.020
Aminohippuric acid	06	574.900
2-Amino-2-(hydroxymethyl)-1,3-propanediol Tris(hydroxymethyl)aminomethane	15	316.000
2-Amino-5-mercapto-1,3,4-thiadiazole	14	320.000
4-Amino-5-methoxy-2-methylbenzenesulfonic acid (5-methyl-o-anisidinesulfonic acid)	03	116.803
m-[(4-Amino-3-methoxyphenyl)azo]benzenesulfonic acid	03	118.000
3-[(4-Amino-5-methoxy-o-tolyl)azo]-1,5-naphthalenedisulfonic acid	03	123.000
2-Amino-2-methyl-1,3-propanediol	15	317.000
2-Amino-2-methyl-1-propanol	15	319.000
2-Amino-2-methylpropyl 8-bromotheophyllinate	03	130.100
2-Amino-4-methylpyridine	03	133.550
2-Amino-5-methylpyridine	03	133.600
2-Amino-4-methylpyrimidine (2-Amino-4-methyl-1,3- diazine)	03	135.000
3-Amino-2,7-naphthalenedisulfonic acid	03	145.000
2-(4-Amino-2-nitroanilino)ethanol	03	169.890
2-Amino-4-nitrophenol	03	175.000
2-[(2-Amino-4-nitrophenyl)amino]-2-hydroxymethyl-1,3-propanediol	03	176.200
2-Amino-5-nitrothiazole	03	178.000
2-Amino-4-nitrotoluene hydrochloride	03	178.400
3-Amino-2-oxazolidinone	03	181.000
5-Amino-2-(2-oxo-5-benzimidazolinyl) aminobenzenesulfonic acid	03	182.000
p-Aminophenol	03	186.000
p-[(p-Aminophenyl)azo]benzenesulfonic acid	03	188.000
7-[(4-Aminophenyl)azo]-1,3-naphthalenedisulfonic acid	03	189.000
1-(3-Aminopropyl)morpholine	15	6.000
2-Aminopyridine	03	194.000
Aminosalicylic acid	06	142.000
2-Aminothiazole nitrate	03	200.050
4-Amino-m-toluenesulfonic acid [SO_3H=1]	03	202.000
6-Amino-m-toluenesulfonic acid [SO_3H=1]	03	203.000
4-Amino-3,5,6-trichloropicolinic acid (Picloram)	13	41.000
Amitriptyline hydrochloride	06	525.000
Ammonium acetate	15	588.000
Ammonium benzoate	15	9.100
Ammonium citrate	15	621.000
Ammonium formate	15	647.400
Ammonium heparin	06	623.000
Ammonium isovalerate	07	127.300
Ammonium lactate	15	672.900
Ammonium mercaptoacetate	15	691.000
Ammonium oxalate	15	722.000
Ammonium oxydiethylenebis (alkly* dimethyl chloride) *Alkyl-40% C_{12}, 50% C_{14}, 10% C_{16}	13	245.022
Ammonium phenolsulfonate	06	553.000
Ammonium polyacrylate	14	426.000
Ammonium stearate	15	749.000
Amobarbital	06	443.000
Amobarbital, sodium	06	444.000
Amoxapine	06	525.300
Amoxicillin (trihydrate)	06	9.600
Amoxicillin (anhydrous)	06	9.500
Amphotericin B	06	1.000
Ampicillin (anhydrous)	06	10.000
Ampicillin (trihydrate)	06	10.100
Ampicillin, sodium	06	11.000
Amprolium	06	166.000
Amyl acetate (n-Pentyl acetate)	15	886.000
Amyl acetates, all other	15	888.000
Amyl alcohol, primary	15	844.100
Amylases, all other	14	98.000
Amyl cinnamic aldehyde dimethyl acetal	07	5.560
Amyl cinnamyl acetate	07	5.600
Amyl cyclohexyl acetate	07	93.900
Amyl hydrogen phosphate	15	1016.500
tert-Amyl hydroperoxide	15	1283.100
Amyl ortho- and para- dimethylaminobenzoates	15	8.002
p-Amylphenol	15	8.080
Amylphenol-formaldehyde, alkoxylated	12	721.500
Amylphenols, mixed isomers	03	212.500
p-tert-Amylphenol sulfide (Tackifier)	09	124.000
Amyris acetate	07	93.650
Anabolic agents and androgens, all other	06	644.000
Androstenedione	06	644.001
Anhydride-acid mixture	15	492.500
Anhydrosorbitol dioleate	12	589.000
Anhydrosorbitol esters, all other	12	603.000
Anhydrosorbitol monoester of tall oil acids	12	590.000

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
Anhydrosorbitol monolaurate	12	591.000
Anhydrosorbitol mono-oleate	12	592.000
Anhydrosorbitol monopalmitate	12	593.000
Anhydrosorbitol monostearate	12	594.000
Anhydrosorbitol sesquioleate	12	596.000
Anhydrosorbitol sesquistearate	12	596.500
Anhydrosorbitol triester of tall oil acids	12	599.000
Anhydrosorbitol trioleate	12	600.000
Anhydrosorbitol tristearate	12	602.000
Aniline (Aniline oil)	03	212.000
Aniline, ethoxylated	12	342.200
2-Anilinoethanol	03	215.000
Anilinomethanesulfonic acid and salt	03	219.000
p-Anilinophenol	09	66.000
Animal grease, sodium salt	12	52.100
Anionic surface-active agents, all other	12	320.000
o-Anisaldehyde (o-Methoxybenzaldehyde)	07	5.950
p-Anisaldehyde	07	6.000
Anisaldehyde bisulfite	15	9.000
o-Anisidinomethanesulfonic acid	03	228.000
Anisole, tech.	03	230.000
Anisoyl chloride	03	230.090
Anisyl acetate	07	7.000
Anthranilic acid (o-Aminobenzoic acid)	03	232.000
N,N'-(1,5-Anthraquinonylene)dianthranilic acid	03	* 237.000
Antibiotics, for medicinal use, all other	06	62.000
Antifungal agents, all other	06	141.000
Antineoplastic agents, all other	06	283.000
Antiviral agents, all other	06	189.000
Apramycin	06	38.600
Arachidylbehenylalkyl amine	12	417.900
Aromatics, C_9	02	36.010
Arsanilic acid	06	151.000
Aryl alkyl polyether alcohol	14	324.000
Ascorbic acid	06	807.000
Aspartic acid	14	2.000
Aspirin	06	385.000
Atracurium besylate	06	745.200
Aurantiol	07	7.100
Aurothioglucose	06	398.000
Azathioprine	06	277.000
Azelaic acid esters, all others	11	70.000
Azidothymidine	06	188.300
2,2-Azobis(dimethyl pentane nitrile)	15	434.600
1,1'-Azobisformamide	15	229.000
2,2-Azobis(2-methyl butane nitrile)	15	434.700
2,2'-Azobis [2-methylpropionitrile] (Azobisisobutyronitrile)	15	435.000
Azoic Black 4	04	251.000
Azoic black compositions, all other	04	253.000
Azoic Blue 3	04	238.000
Azoic blue compositions, all other	04	241.000
Azoic Brown 9	04	246.000
Azoic brown compositions, all other	04	249.000
Azoic Coupling Component 2	04	297.000
Azoic Coupling Component 3	04	298.000
Azoic Coupling Component 4	04	299.000

Chemical name	Sect. No.	Item No.
Azoic Coupling Component 7	04	301.000
Azoic Coupling Component 12	04	305.000
Azoic Coupling Component 14	04	307.000
Azoic Coupling Component 17	04	310.000
Azoic Coupling Component 18	04	311.000
Azoic Coupling Component 20	04	313.000
Azoic Coupling Component 21	04	314.000
Azoic Coupling Component 29	04	316.000
Azoic Coupling Component 34	04	317.000
Azoic Coupling Component 43	04	319.000
Azoic Diazo Component 5, base	04	257.000
Azoic Diazo Component 13, base	04	262.000
Azoic Diazo Component 32, base	04	265.000
Azoic Diazo Component 1, salt	04	271.000
Azoic Diazo Component 3, salt	04	273.000
Azoic Diazo Component 5, salt	04	275.000
Azoic Diazo Component 8, salt	04	277.000
Azoic Diazo Component 9, salt	04	278.000
Azoic Diazo Component 10, salt	04	279.000
Azoic Diazo Component 11, salt	04	280.000
Azoic Diazo Component 12, salt	04	281.000
Azoic Diazo Component 13, salt	04	282.000
Azoic Diazo Component 14, salt	04	283.000
Azoic Diazo Component 20, salt	04	284.000
Azoic Diazo Component 32, salt	04	285.000
Azoic Diazo Component 34, salt	04	286.000
Azoic Diazo Component 35, salt	04	287.000
Azoic Diazo Component 41, salt	04	290.000
Azoic Diazo Component 42, salt	04	291.000
Azoic Diazo Component 44, salt	04	292.000
Azoic Diazo Component 48, salt	04	293.000
Azoic Diazo Component 49, salt	04	294.000
Azoic diazo components, base, all other	04	270.000
Azoic diazo components, salt, all other	04	296.000
Azoic Orange 3	04	224.000
Azoic Red 1	04	227.000
Azoic Red 2	04	228.000
Azoic Red 6	04	229.000
Azoic red compositions, all other	04	234.000
Azoic Violet 1	04	235.000
Azoic violet compositions, all other	04	236.000
Azoic Yellow 1	04	220.000
Aztreonam	06	38.700
Bacillus thuringiensis	13	166.010
Bacitracin (animal feed grade)	06	63.000
Bacterial amylase	14	93.000
Barium acetate	15	589.000
Barium benzoate	15	9.260
Barium cadmium laurate	15	677.000
Barium 2-ethylhexanoate	15	630.000
Barium laurate	15	676.900
Barium naphthenate	14	296.000
Barium stearate	15	750.000
Basic black dyes, all other	04	359.999
Basic black dyes, all other, modified	04	420.000
(Basic Blue 7)	05	123.007

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
Basic Blue 1	04	343.000
Basic Blue 3	04	400.000
Basic Blue 7	04	347.000
Basic Blue 21	04	401.000
Basic Blue 41	04	404.000
Basic Blue 54	04	407.000
Basic Blue 60	04	408.000
Basic Blue 77	04	412.000
Basic Blue 94 and 94:1	04	414.094
Basic Blue 140	04	414.140
Basic Blue 152	04	350.152
Basic blue dyes, all other	04	351.000
Basic blue dyes, all other, modified	04	415.000
(Basic Blue 14, PMA)	05	227.014
(Basic Blue 1, PTA)	05	227.001
Basic Brown 1	04	355.000
Basic Brown 4	04	357.000
Basic brown dyes, all other	04	358.000
Basic Green 4	04	354.000
Basic green dyes, all other	04	354.100
(Basic Green 1, PMA)	05	230.101
Basic Orange 1	04	326.000
Basic Orange 2	04	327.000
Basic Orange 21	04	372.000
Basic Orange 26	04	376.000
Basic orange dyes, all other	04	329.000
(Basic Red 1)	05	215.001
Basic Red 12	04	333.000
Basic Red 14	04	383.000
Basic Red 15	04	384.000
Basic Red 17	04	386.000
Basic Red 22	04	389.000
Basic Red 29	04	390.000
Basic Red 46	04	391.046
Basic Red 49	04	392.000
Basic Red 54	04	392.054
Basic Red 73	04	392.073
Basic Red 104	04	392.104
Basic Red 111	04	392.111
Basic red dyes, all other	04	334.000
(Basic Red 81, PMA)	05	210.050
(Basic Violet 1)	05	221.001
(Basic Violet 4)	05	221.004
(Basic Violet 10)	05	221.010
Basic Violet 1	04	335.000
Basic Violet 3	04	337.000
Basic Violet 4	04	338.000
Basic Violet 10	04	339.000
Basic Violet 16	04	396.000
Basic Violet 35	04	398.035
Basic violet dyes, all other	04	342.000
Basic Yellow 2	04	323.000
Basic Yellow 11	04	360.000
Basic Yellow 13	04	361.000
Basic Yellow 15	04	362.000
Basic Yellow 24	04	364.000
Basic Yellow 25	04	365.000
Basic Yellow 28	04	367.000
Basic Yellow 29	04	368.000
Basic Yellow 37	04	324.000
Basic Yellow 53	04	370.053
Basic Yellow 58	04	370.058
Basic Yellow 65	04	370.065
Basic Yellow 79	04	370.079
Basic Yellow 83	04	370.083
Basic Yellow 94	04	370.094
Basic Yellow 96	04	370.096
Basic yellow 98	04	370.098
Basic yellow 102	04	370.102
Basic yellow dyes, all other	04	325.000
Basic yellow dyes, all other, modified	04	371.000
(Basic Yellow 2), fugitive	05	15.000
Beclomethasone	06	648.500
Behenamide	15	229.200
Benzaldehyde glyceryl acetal	07	7.500
Benzaldehyde, tech.	03	247.000
Benzalkonium heparin	06	624.500
Benzanilide	03	259.000
Benzene-, cumene-, toluene-, and xylenesulfonates, all other	12	151.000
Benzene 1,3-dihydroxy-2,4 nitroso	15	9.010
Benzene high purity (98-100%)	02	5.500
Benzene, all other	02	6.500
Benzenephosphinic acid	15	9.250
Benzene phosphonous dichloride	15	9.255
Benzenesulfonic acid	03	264.000
Benzene sulfonic acid	12	137.710
Benzenesulfonic acid, 2-formyl-, sodium salt	03	264.200
Benzenesulfonyl chloride	03	266.000
Benzene, toluene, xylene, mixtures	02	33.000
1,2,4-Benzenetricarboxylic acid, 1,2-dianhydride (Trimellitic anhydride)	03	268.100
Benzhydrol (Diphenylmethanol)	03	269.000
Benzimidazole	03	273.100
Benzocaine	06	704.000
1,3-Benzodioxole	03	273.500
Benzoic acid	06	134.000
Benzoic acid, 2-butoxyethanol ester	15	9.015
Benzoic acid,2-[4-(dimethylamino)-benzoyl]-	03	274.850
Benzoic acid, C_{12}-C_{15} ester	15	9.030
Benzoic acid, isodecyl ester	15	9.050
Benzoic acid, methyl ester	03	274.903
Benzoic acid, tech.	03	275.000
Benzonatate	06	425.000
Benzonitrile	03	278.000
Benzophenone	07	8.000
2-Benzothiazolethiol, sodium salt	03	278.200
1H-Benzotriazole	03	281.000
Benzotriazole, polychlorinated	15	15.300
Benzotriazole, substituted	15	15.500
2-Benzoxazolethiol	03	283.200
Benzoyl chloride	03	286.000

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
Benzoyl peroxide	15	16.000
Benzthiazide	06	718.000
Benztropine mesylate	06	308.000
Benzyl acetate	07	9.000
Benzyl alcohol	15	17.000
Benzyl(alkylpyridinium)chloride	12	508.190
Benzylamine	03	289.000
2-(Benzylamino)ethanol	03	290.000
Benzyl (polyoxyethylene, octadecylamine) ammonium chloride with benzyl(polyoxyethylene, tallowamine) ammonium chloride	12	453.230
Benzyl benzoate	07	11.000
Benzyl butyrate	07	12.000
Benzyl chloroformate	15	17.115
Benzyl-2-chloro-4-(trifluoromethyl)-5-thiazolecarboxylate	13	175.012
Benzyl cinnamate	07	13.000
Benzyl(cocoamidopropyl)dimethyl ammonium chloride	12	508.800
Benzyl(coconut oil alkyl)bis(2-hydroxyethyl)ammonium chloride	12	449.000
Benzyl(coconut oil alkyl)dimethylammonium chloride	12	509.000
Benzyl-di(hydrogenated tallow alkyl)methylammonium chloride	12	509.900
Benzyldimethyl(mixed alkyl)ammonium chloride	12	510.000
Benzyldimethyloctadecylammonium chloride	12	511.000
Benzyldimethyl(tallow alkyl)ammonium chloride	12	512.800
6-benzyledenine (bap)	13	*231.251
5-(Benzylethylamino)-o-toluenesulfonic acid	03	293.000
Benzyl formate	07	15.000
Benzylhexadecyldimethylammonium chloride	12	515.000
Benzyl(hydrogenated tallow alkyl)dimethylammonium chloride	12	516.000
2-Benzyl-2'-hydroxy-5,9-dimethyl-6,7-benzomorphanhydrobromide	03	294.950
1-Benzyl-1-(2-hydroxyethyl)-2-nor(tall oil alkyl)-2-imidazoline	12	453.000
Benzyl isobutyrate	07	15.400
Benzyl isopentyl ether	07	15.600
Benzyl isovalerate	07	15.700
Benzyl-methyl-bis(hydrogenated tallow)ammonium chloride	12	516.500
Benzyl(mixed alkyl)pyridinium chloride	12	516.670
1-(Benzyloxy)-2-methoxy-4-propenylbenzene(Benzyl isoeugenyl ether)	07	16.000
Benzyl phenylacetate	07	17.000
1-Benzyl-4-phenylisonipecotic acid	03	298.000
Benzyl picolinium chloride	12	517.100
Benzyl propionate	07	18.000
1-Benzylpyridinium chloride	12	518.000
1-Benzyl quinolinium chloride	12	518.200
Benzyl salicylate	07	19.000
Benzyl(tallow alkyl)bis(2-hydroxyethyl)ammonium chloride	12	453.500
Benzyltrichloroacetimidate	03	298.500
Benzyltriethylammonium chloride	03	298.400
Benzyltrimethylammonium chloride	12	519.000
Benzyltrimethylammonium hydroxide	03	300.000

Chemical name	Sect. No.	Item No.
Beta carotene (provitamin A)	06	769.000
Betaine hydrochloride	06	614.000
Betamethasone	06	649.000
Betamethasone dipropionate	06	649.500
Betamethasone sodium phosphate	06	650.000
Betamethasone valerate	06	651.000
Beta methyl ionone coevr	07	104.100
Bethanechol chloride	06	314.500
Biological stains	14	24.000
Biotin	06	794.000
Biphenyl	03	307.000
N,N-Bis(2,2-acetamido)glycine	14	3.000
Bis(N-amidopropyl)-N,N-dimethyl-N-ethylammonium ethyl sulfate, dimer acid	12	467.500
1,4-Bis(3-aminopropyl)piperazine	03	308.500
2,6-Bis(p-azidobenzylidene)-4-methylcyclohexanone	03	311.400
Bis2-(bis2-hydroxyethylamino)ethyldiisopropyl titan	15	058.600
Bis-1,4-bromoacetoxy-2-butene	13	176.000
2,2-Bis(bromomethyl)-1,3-propanediol	15	1071.000
Bis(2-butoxyethyl)ether (Diethylene glycol di-n-butyl ether)	15	1142.000
1,1-Bis(carboxymethyl)-2-undecyl-2-imidazolinium chloride, disodium salt	12	20.000
Bisp-chlorobenzoylperoxide	15	17.900
Bis(2-chloroethyl)ether (Dichlorodiethyl ether)	15	1300.000
Bis (2-Chloroethyl)-2-chloroethylphosphonate	15	1017.000
Bis(coconut oil alkyl)amine	12	431.000
Bis(coconut oil alkyl)dimethylammonium chloride	12	480.000
Bis-cumylphenyl-oxoethylene titanate	12	775.800
1,2-Bis(3,5-di-tert-butyl-4-hydroxyhydrocinnamoyl) hydrazine	15	17.980
Bis(dibutylthiocarbamoyl) disulfide	09	144.950
Bis(2,4-dichlorobenzoyl) peroxide	15	18.000
Bis(dimethylaminoethyl) ether	15	322.900
Bis(α,α -dimethylbenzyl)peroxide	15	19.000
bis(1,3-Dimethylbutyl)phosphorodithioate oleyl amine salt	14	232.000
N,N'-Bis(1,4-dimethylpentyl)-p-phenylenediamine	09	55.551
S-[1,2-Bis(ethoxycarbonyl)ethyl]O,O-dimethyl phosphorodithioate (Malathion)	13	215.000
Bis(2-ethoxyethyl)ether (Diethylene glycol diethyl ether)	15	1143.000
Bis(2-ethylhexyl)hydrogen phosphite	15	1019.000
Bis(2-ethylhexyl)terephthlate	11	16.550
N,N'-Bis(1-ethyl-3-methylpentyl)-p-phenylenediamine	09	56.000
Bis(ethyl-3-oxobutanato)bis(2-propanolato) titanium	15	1058.800
Bis(N,N1-ethyl(stearic/arachidic/behenic)amide) cyanoethyl ethylammonium ethosulfate	12	470.400
2,2-Bis(ferrocenyl)propane	15	19.200
Bis-hexamethylenetriamine amine	15	260.000
Bis(hydrogenated tallow alkyl)amine	12	432.000
Bis(hydrogenated tallow alkyl)dimethylammonium chloride	12	481.000
Bis(hydrogenated tallow alkyl)dimethylammoniummethyl sulfate	12	482.000
N,N-Bis(2-hydroxyethyl)aniline	03	325.500
Bis(2-hydroxyethyl, ethoxylated)methyloctadecylammonium chloride	12	455.000

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
Bis-2-hydroxyethyl-hydrogenated tallow-ethyl sulfate	12	455.500
Bis-(2-hydroxyethyl)isodecyloxypropylamine oxide	12	321.700
N,N-Bis(2-hydroxyethyl)octadecylamine	12	322.000
Bis-2-hydroxyethyl-octyl-methyl-p-toluene sulfonate	12	455.600
N,N-Bis(2-hydroxyethyl)(tallow alkyl)amine	12	324.000
Bis(2-hydroxyethyl)tallowammonium ethanoate	12	0.500
2,2-Bis(hydroxy-methyl)-propionic acid	15	494.500
2,2-Bis(4-hydroxyphenyl)4-methylpentane	15	20.550
Bis(hydroxypropyl) azelate	11	66.600
4,6-Bis(isopropylamino)-2-methoxy-s-triazine (Prometon)	13	118.010
2,4-Bis(isopropylamino)-6-(methylthio)-s-triazine (Prometryn)	13	41.500
Bis [2-(2-methoxyethoxy)ethyl]ether (Tetraethylene glycol dimethyl ether)	15	1145.000
Bis(2-methoxyethyl)ether (Diethylene glycol dimethyl ether)	15	1146.000
N,N'-Bis(1-methylheptyl)-p-phenylenediamine	09	60.000
N,N-Bis((4-methylphenyl)sulfonyl)amine, potassium salt	03	327.500
Bis(morpholinothiocarbamoyl) disulfide	09	38.500
Bismuth 2-ethylhexanoate	15	630.500
Bismuth neodecanoate	15	701.900
Bis[2-(octadecylamido)ethyl-]N-(2-cyanoethyl)-N-ethyl ammonium ethyl sulfate	15	229.500
Bis(pentachloro-2,4-dicyclopentadien-1-yl)	13	128.000
Bis(perfluoroalkyl)bis(alpha-monochlorohydryl) pyromellitate	15	21.080
Bisphenol A, ethoxlated and propoxylated	12	742.095
Bisphenol A, ethoxylated	12	742.090
Bisphenol, hindered	09	88.100
Bis(tallow alkyl)dimethylammonium chloride	12	482.500
1,2-Bis(tribromophenoxy)ethane	03	330.218
Bis(tributyltin) oxide	13	195.015
Bis(triphenylsilyl)chromate	15	21.400
Bitolylene diisocyanate (TODI)	03	1017.000
Blend of fatty and phosphate esters	12	111.800
Blowing agents, cyclic, all other	09	110.000
Boric acid-amine adducts	15	1367.700
Bornyl phenylamine	14	271.000
Boron fluoride phenol complex	15	22.000
Boron trichloride-amine complex (DY 9577)	15	1368.200
Bromchlorenone	06	251.000
Brominated (including bromochlorinated) hydrocarbons, all other	15	1216.000
Bromoacetic acid	13	245.017
Bromoacetic acid	15	495.000
Bromobenzene,mono	03	335.000
o-Bromobenzoic acid	03	336.000
3-[3-(4'-Bromo1,1'-biphenyl]-4-yl)-1,2,3,4-tetrahydro-1-naphthalenyl-4-hydroxy-2H-1-benzopyran-2-one	13	169.500
1-Bromobutane (n-Butyl bromide)	15	1197.000
5-Bromo-3-sec-butyl-6-methyluracil (Bromacil)	13	42.000
Bromobutyric acid	15	496.000
Bromochlorodifluoromethane	15	1252.800
Bromochloromethane	15	1199.000
2-Bromo-1-chloro-1,2,2-trifluoroethane	15	1253.100
2-Bromo-2-chloro-1,1,1-trifluoroethane (Halothane)	15	1253.000
4-Bromo-3,5-dihydroxybenzamide	03	343.503
4-Bromo-3,5-dihydroxybenzoic acid	03	343.700
2-Bromo-4,6-dinitroaniline	03	344.000
Bromoethane (Ethyl bromide)	15	1202.000
1-Bromo-4-ethoxy-2-methylbenzene	03	344.900
1-Bromohexadecane	15	1202.990
2-Bromohexanoic acid	15	496.500
2-Bromo-4'-hydroxyacetophenone	13	40.017
1-Bromo-2-methyl-2-butene	15	1205.000
β-Bromo-β -nitrostyrene	15	22.400
1-Bromo-octadecane	15	1206.000
1-Bromopentane (n-Amyl bromide)	15	1207.000
1-Bromopropane (n-Propyl bromide)	15	1209.000
2-Bromopropane (Isopropyl bromide)	15	1210.000
2-Bromopyridine	03	359.000
Bromotrifluoromethane	15	1254.000
Brompheniramine maleate	06	85.000
Butabarbital	06	447.000
Butabarbital, sodium	06	448.000
Butadiene and butylene fractions	02	49.000
1,3-Butadiene, grade for rubber (Elastomers)	02	48.000
Butalbital	06	449.000
Butamben	06	700.000
1,2(and 1,3)-Butanediol	15	1072.000
1,4-Butanediol	15	1073.000
1,4-Butanediol diglycidyl ether	15	1317.400
1,2,4-Butanetricarboxylic acid, 2-phosphono, sodium salt	15	619.200
Butanoic acid, 1-cyclohexylethyl ester	07	127.470
Butanol, ethoxylated	12	726.900
2-Butanol, ethoxylated and propoxylated	12	726.910
2-Butanone peroxide (MEK peroxide)	15	1284.000
1-Butene	02	45.000
2-Butene	02	46.000
1-Butene and 2-butene, mixed	02	47.000
2-Butenedioic acid-(ξ)-diamine1-(2-aminoethyl)-2-(tall oil alkyl)-2-imidazoline condensate	12	342.220
2-Butene-1,4-diol	15	1074.000
2,3,4,5-δ-Butenylene-tetrahydrofurfural	13	166.014
1-Butoxy-2,3-epoxypropane (Butyl glycidyl ether)	15	1317.460
2-Butoxyethanol (Ethylene glycol monobutyl ether)	15	1147.000
2-(2-Butoxyethoxy)ethanol (Diethylene glycol monobutyl ether)	15	1148.000
2-2-(2-Butoxyethoxy)ethoxyethanol (Triethylene glycol monobutyl ether)	15	1149.000
α-2-(2-n-Butoxyethoxy)ethoxy-4,5-methylenedioxy-2-propyltoluene (Piperonyl butoxide)	13	172.000
2-(2-Butoxyethoxy)ethyl acetate	15	1098.000
1-Butoxyethoxy-2-propanol	15	1150.000
2-Butoxyethyl acetate	15	1099.000
2-Butoxyethyl benzoate	15	22.990
Butoxyethylene oxyacetic acid, sodium salt	12	35.950
Butoxyethyl phosphate	12	92.200
n-Butyl acetate	15	890.000
n-Butyl acetylricinoleate	11	106.000

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
Butyl acid phosphate	15	1020.000
Butyl acrylate	15	893.000
Butyl acrylate ethyl acrylate copolymer resins	08	19.950
n-Butyl alcohol (n-Propylcarbinol)	15	845.000
sec-Butyl alcohol (Methylethylcarbinol)	15	846.000
tert-Butyl alcohol (Trimethylcarbinol)	15	847.000
Butyl alcohol, ethoxylated and phosphated	12	76.100
Butyl alcohol, propoxylated	12	734.950
n-Butylamine, mono	15	261.000
sec-Butylamine, mono	15	264.000
tert-Butylamine, mono	15	265.000
Butyl p-aminobenzoate	03	365.000
2-(sec-Butylamino)-4-ethylamino-6-methoxy-s-triazine	13	118.041
tert-Butylaminoethyl methacrylate	15	327.455
p-Butylaniline	03	368.000
p-tert-Butylbenzaldehyde	03	370.000
n-Butylbenzene	03	371.000
N-n-butyl benzenesulfonamide	11	0.500
Butyl benzoate	15	23.000
N-tert-Butyl-2-benzothiazolesulfenamide	09	25.000
tert-Butylbenzylamine	12	323.700
Butyl benzyl phthalate	11	17.000
n-Butyl-4,4-bist-butylperoxyvalerate	15	1284.200
Butyl butyrate	07*	127.495
Butyl butyrl lactate	07	127.500
sec-Butyl chloroformate	15	898.000
3-tert-Butyl-5-chloro-6-methyluracil	13	118.018
2-tert-Butyl-p-cresol	03	377.000
6-tert-Butyl-o-cresol	03	380.300
2-tert-Butyl cyclohexanol	07	93.710
2-sec-Butylcyclohexanone	07	93.700
o-tert-Butylcyclohexyl acetate	07	93.800
p-tert-Butylcyclohexyl acetate (Verbeniax)	07	94.000
tert-Butyldiethanolamine	15	327.500
tert-Butyldiphenylchlorosilane	03	379.500
Butylene glycol adipate	11	58.750
1,3-Butylene glycol diborate	15	1100.150
1,3-Butylene glycol diborate/hexylene glycol boric anhydride	15	1100.155
1,3-Butylene glycol, ethoxylated	12	758.940
Butylene oxide	15	1303.000
tert-Butyl ethanolamine	15	327.900
Butyl ethers of tetra- and higher ethylene glycols (high boiling)	15	1151.500
n-Butylethylamine	15	267.000
Butyl 2-ethylhexyl phthalate	11	21.000
Butyl ethyl magnesium	15	1374.800
N-Butyl-N-ethyl-α, α, α-trifluoro-2,6-dinitro-p-toluidine (Benefin)	13	43.000
Butyl formcel	15	1430.000
tert-Butyl hydroperoxide	15	1285.000
tert-Butylhydroquinone	15	24.850
4,4'-Butylidenebis(6-tert-butyl-m-cresol)	09	88.200
Butyl(isobutylene-isoprene) type	10	9.000
Butyl and isopropyl phthalimides	15	27.495

Chemical name	Sect. No.	Item No.
Butyl lactate	15	900.000
Butyl levulinate	15	900.400
n-Butyllithium	15	1372.000
sec-Butyllithium	15	1373.000
Butyl maleate	15	901.000
n-Butyl mercaptan (1-Butanethiol)	02	90.910
sec-Butyl mercaptan (2-Butanethiol)	02	90.915
tert-Butyl mercaptan (2-Methyl-2-propanethiol)	02	91.000
Butyl mercaptopropionate	15	901.800
Butyl methacrylate	15	902.000
Butyl methacrylate-ethyl methylacrylate copolymer resins	08	19.960
2(and 3)-tert-Butyl-4-methoxyphenol (BHA)	15	25.000
p-tert-Butyl-α -methylhydrocinnamalehyde	07	21.900
2-[(1-Butyl-2-methylindol-3-yl]carbonylbenzoic acid	03	382.200
Butyl methyl pyrophosphate ethlenedioxy titanium salt/n, n-dimethyl amino ethyl methacrylate salt	12	102.205
Butyl methyl pyrophosphate isopropoxy titanium salt octyl phosphite adduct	12	92.300
Butylmorpholine	15	25.500
Butylnaphthalenesulfonic acid, sodium salt	12	162.000
Butyl octyl phthalates	11	23.000
Butyl oleate	11	90.000
Butyl oleate	15	909.000
Butyl oleate, sulfated, sodium salt	12	257.000
n-Butyl palmitate	11	96.200
n-Butyl perchlorocrotonate	15	902.500
tert-Butyl peroxide (Di-tert-butyl peroxide)	15	1286.000
tert-Butyl peroxyacetate	15	1286.200
tert-Butyl peroxybenzoate	15	26.000
tert-Butyl peroxy-2-ethylhexanoate	15	1286.250
tert-Butyl peroxyisobutyrate	15	1286.280
tert-Butyl peroxyisopropylcarbonate	15	1286.300
tert-Butylperoxy maleic acid	15	498.000
tert-Butyl peroxyneodecanoate	15	1286.330
tert-Butyl peroxypivalate	15	1287.000
o-sec-Butylphenol	03	383.000
o-tert-Butylphenol	03	385.000
p-sec-Butylphenol	03	384.000
p-tert-Butylphenol	03	386.000
P-tert-Butylphenol-formaldehyde, alkoxylated	12	721.600
Butylphenols, mixed	03	387.000
2-(p-tert-Butylphenoxy)cyclohexyl-2-propynyl sulfite	13	166.017
p-tert-Butylphenyl glycidyl ether	15	25.200
tert-Butylphenyl glycidyl ether	15	26.550
N-(3-(p-tert-butylphenyl)-2-methylpropylidene)-anthrantlic acid, methyl ester	07	21.920
Butyl phosphate	12	92.400
Butyl phosphate, potassium salt	12	92.500
Butyl phthalyl butyl glycolate	11	41.400
Butyl picolinium bromide	12	519.500
Butyl ricinoleate	11	107.000
n-Butyl stearate	11	117.000
p-tert-Butyltoluene	03	388.000

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
Butyl 2-[4-[[5-(trifluoromethyl)-2- pyridinyl]oxy]phenoxypropanoate	13	43.050
Butyl undecylenate	07	127.650
tert-Butyl urea	15	329.500
Butyl vinyl ether	15	1305.000
6-tert-Butyl-2,4-xylenol	03	391.000
2-Butyne-1,4-diol	15	1075.000
Butyraldehyde	15	784.000
Butyraldehyde-aniline condensate	09	52.000
Butyraldehyde diethyl acetal	07	127.655
i-Butyraldehyde trimer	15	1151.700
Butyric acid	15	499.000
Butyric anhydride	15	500.000
Butyrolactone	15	104.500
n-Butyronitrile	15	436.000
Butyryl chloride	15	501.000
Cadmium 2-ethylhexanoate	15	631.000
Cadmium laurate	15	677.300
Cadmium naphthenate	14	297.000
Cadmium stearate	15	751.000
Caffeine, natural	06	537.000
Caffeine, synthetic	06	538.000
Calcitonin	06	691.500
Calcium acetate	15	591.000
Calcium t-α-alkylcarboxylate	15	668.000
Calcium ascorbate	06	808.000
Calcium citrate	15	622.000
Calcium 2-ethylhexanoate	15	632.000
Calcium formate	15	648.000
Calcium gluceptate	06	759.000
Calcium linoleate	15	681.000
Calcium manganese tallate	15	170.000
Calcium mercaptoacetate	15	693.000
Calcium naphthenate	14	298.000
Calcium neodecanoate	15	703.000
Calcium oleate	15	718.500
Calcium polycarbophil	06	591.600
Calcium propionate	15	737.000
Calcium stearate	15	752.000
Calcium undecylenate	06	135.000
Camphene	15	29.000
Campholenic aldehyde	15	29.100
Canrenoate, potassium	06	736.700
Canrenoate, potassium	07	111.500
Capramidopropyl betaine	12	0.600
Capreomycin	06	39.150
Capric acid (Ratio = 2/1)	12	530.000
Capric acid (Ratio = 1/1)	12	546.010
Caprolactam (2-Oxohexamethylenimine)	15	29.500
Caprolactam magnesium bromide	15	29.505
Caprolactone	15	104.600
3-Caprylamidoethylene-(2-hydroxyethyl)aminopropionic acid	12	0.700
Caprylamphopropionate	12	9.800
Caprylic amphopropionate	12	705.300
Captopril	06	355.400
Carbamate 82m	15	267.200
Carbenicillin, disodium	06	12.000
Carbenicillin indanyl, sodium	06	12.500
Carbidopa	06	830.500
1-(carboethoxy)ethyl 5-[2-chloro-4-(trifluoromethyl) phenoxy]-2-nitrobenzoate	13	118.068
2-Carbomethoxy-1-propen-2-yl dimethyl phosphate	13	216.000
Carbon Black oil	01	21.010
Carbon disulfide	15	1296.600
Carbon tetrachloride	15	1217.000
4,4'-Carbonylbis[phthalic anhydride]	03	400.100
Carboplatin	06	278.100
1-Carboxyethyl-1-(2-hydroxyethyl)-2-heptyl-2-imidazolinium hydroxide, sodium derivative, sodium salt	12	21.200
1-Carboxyethyl-1-(2-hydroxyethyl)-2-nonyl-2-imidazolinium hydroxide, sodium derivative, sodium salt	12	21.250
(1-Carboxyheptadecyl)trimethylammonium hydroxide, inner salt	12	1.000
5(or 6)carboxy-4-hexyl-2-cyclohexene-1-octanoic acid, potassium/sodium salts	12	52.500
5(or 6)-Carboxy-4-hexyl-2-cyclohexene-1-octanoic acid, reaction products with castor oil	12	38.500
Carboxylic acid alkanolamine condensates, all other	12	582.000
Carboxylic acid amides, all other	12	588.000
Carboxylic acid-diamine and polyamine condensate, all other	12	587.000
Carboxylic acid-diamine and polyamine condensates, all other	12	374.000
Carboxylic acid-diamine and polyamine condensates, alkoxylated, all other	12	384.000
Carboxylic acid esters, all other	12	721.000
Carboxylic acids, all other	12	75.000
Carboxylic acids with amide, ester or ether linkage, other	12	51.000
N-Carboxy-N-methylanthranilic anhydride	03	351.400
Carboxymethyl-[3-cocoamidopropyl] dimethyl ammonium chloride, sodium salt	12	3.980
(Carboxymethyl)3-(coconut oil amido) propyldimethylammonium hydroxide, inner salt	12	4.000
1-Carboxymethyl-2-heptadecyl-1-(2-hydroxyethyl)-2-imidazolinium hydroxide, sodium derivative, sodium salt	12	22.000
1-Carboxymethyl-1-(2-hydroxyethyl)-2-heptyl-2-imidazoliniumhydroxide, sodium derivative, sodium salt	12	22.600
1-Carboxymethyl-1-(2-hydroxyethyl)-2, imidazoliwium hydroxide sodium derivative, sodium salt	12	23.200
1-Carboxymethyl-1-(2-hydroxyethyl)-2-nonyl-2-imidazolinium hydroxide, sodium derivative, sodium salt	12	24.000
1-Carboxymethyl-1-(2-hydroxyethyl)-2-undecyl-2-imidazolinium hydroxide, sodium derivative, sodium salt	12	25.000
1-Carboxymethyl-1-(2-hydroxyethyl)-2-undecyl-2-imidazoliniumhydroxide, sodium derivative, sodium salt	12	21.300
(Carboxymethyl)-3-(lauryl amido propyl) dimethyl ammonium hydroxide inner salt	12	21.400
(1-Carboxyundecyl)trimethylammonium hydroxide, inner salt	12	9.000

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
Carnuba wax, ethoxylated	12	668.950
Carvacrol	07	23.500
l-Carvone	07	94.300
α-Caryophyllene	07	94.500
Castor oil acids (Ratio = 2/1)	12	531.000
Castor oil acids, potassium salt	12	52.000
Castor oil, ethoxylated	12	669.000
Castor oil fatty acids, dehydrated	15	502.000
Castor oil, sulfated, sodium salt	12	305.000
Cationic surface-active agents, all other	12	529.000
α-Cedrene epoxide (Andrane)	07	94.760
Cedrenol	07	94.780
Cedrol	07	94.790
Cedryl acetate	07	94.800
Cedryl formate	07	94.810
Cefaclor	06	39.300
Cefamandole	06	39.500
Cefazolin, sodium	06	40.000
Cefonicid	06	40.100
Cefoxitin	06	40.200
Ceftazidime	06	40.500
Ceftazidine dihydrochloride	06	40.600
Cefuroxime	06	40.700
Cellulose acetate	14	384.000
Cellulose acetate	08	20.990
Cellulose acetate butyrate	08	21.000
Cellulose acetate hexahydrophthalate	15	29.900
Cellulose acetate phthalate	15	30.000
Cellulose acetate propionate	08	21.010
Cellulose ethers and esters, all other	14	413.000
Cellulose, oxidized	06	635.000
Cellulose plastics, all other	08	21.040
Celtone	15	1430.250
Cephalexin	06	41.000
Cephalothin, sodium	06	43.000
Cephradine	06	43.600
Cerium 2-ethylhexanoate	15	632.200
Cetyleicosyl methacrylate	15	911.700
Cetylpyridinium chloride	06	256.000
Chelating agents, nitriloacids and salts, all other	14	90.000
Chemical indicators	14	91.000
Chemically defined linear alcohol, alkoxylated, all other	12	734.000
Chemical reagents and fine chemicals	14	92.000
Chlorinated fatty materials	15	1327.700
Chlorinated (not otherwise halogenated) hydrocarbons, all other	15	1252.000
Chlorinated insecticides, cyclic, all other	13	147.000
Chlorinated paraffins, 35-64% chlorine	15	1219.000
Chlorinated paraffins, less than 35% chlorine	15	1218.000
Chlorinated paraffins, 65% or more chlorine	15	1220.000
Chlorinated rubber, natural and synthetic	10	9.050
Chloroacetic acid, mono	15	503.000
4'-Chloroacetophenone	03	411.000
Chloroalkyl diphosphate ester, neutral	15	1021.700
Chloroalkyl phosphate ester	15	1021.702

Chemical name	Sect. No.	Item No.
1-(3-Chloroallyl)-3,5,7-triazo-1-azoniaadamatane chloride	15	32.000
2-Chloro-4-aminotoluene	03	412.500
o-Chloroaniline	03	414.000
p-Chloroaniline	03	415.000
p-Chlorobenzaldehyde	03	425.000
Chlorobenzene, mono	03	427.000
p-Chlorobenzenesulfonic acid	03	430.000
5-Chlorobenzotriazole	14	329.000
4-Chloro-2,6-bis(2,4-dihydroxybenzyl)phenol	09	124.200
2-Chloro-4,6-bis(ethylamino)-s-triazine (Simazine)	13	44.050
2-Chloro-4,6-bis(isopropylamino)-s-triazine (Propazine)	13	44.100
1-Chlorobutane (n-Butyl chloride)	15	1221.000
2-Chloro-1,4-dibutoxybenzene	03	440.780
1-Chloro-2,5-dibutoxy-4-nitrobenzene	03	440.803
2-Chloro-1,4-diethoxybenzene	03	440.900
1-Chloro-2,5-diethoxy-4-nitrobenzene	03	441.000
2-Chloro-2',6'-diethyl-N-(n-butoxymethyl)acetanilide (Butachlor)	13	44.160
2-Chloro-2',6'-diethyl-N-(methoxymethyl)acetanilide (Alachlor)	13	44.180
1-Chloro-1,1-difluoroethane	15	1255.000
Chlorodifluoromethane (F-22)	15	1256.000
4'-Chloro-2',5'-dimethoxyacetoacetanilide	03	448.000
2-Chloro-1,4-dimethoxybenzene	03	451.200
2-Chloro-4,6-dimethylaniline	03	450.500
2-Chloro-N,N-dimethylethylamine(Dimethylamino ethyl chloride) hydrochloride	15	334.000
1-Chloro-2,4-dinitrobenzene (Dinitrochlorobenzene)	03	453.000
3-Chlorodiphenylamine	03	457.000
2-Chloro-N-ethoxymethyl-N-(2-ethyl-6-methylphenyl) acetamide (Acctochlor)	13	44.190
2-Chloro-1-(3-ethoxy-4-nitrophenoxy)-4-(trifluoromethyl) benzene (Oxyfluorfen)	13	118.044
2-Chloro-4-(ethylamino)-6-(isopropylamino)-s-triazine (Atrazine)	13	45.000
2-[4-Chloro-6-(ethylamino)-s-triazin-2-ylamino]-2-methylpropionitrile (Cyanazine)	13	45.100
p-[(2-Chloroethyl)methylamino]benzaldehyde	03	463.000
Chloroform	15	1224.000
2-Chloro-N-isopropylacetanilide (Propachlor)	13	45.200
Chloromethane (Methyl chloride)	15	1226.000
2-Chloro-N-(4-methoxy-6-methyl-1,3,5-triazin-2-yl) aminocarbonylbenzenesulfonamide	13	118.054
Chloromethylene dimethyliminium (Amide chloride)	15	231.700
Chloromethyl methyl ether	15	1307.000
4-Chloro-2-methylphenoxyacetic acid, dimethylamine salt	13	109.011
4-Chloro-2-methylphenoxyacetic acid, iso-octyl ester	13	109.010
2-(4-Chloro-2-methylphenoxy)propionic acid, dimethylamine salt	13	118.048
3-Chloro-2-methyl-1-propene (Methallyl chloride)	15	1228.000
1-Chloro-2-nitrobenzene (Chloro-o-nitrobenzene)	03	495.000
1-Chloro-4-nitrobenzene (Chloro-p-nitrobenzene)	03	498.000
2-Chloro-4-nitrobenzoic acid	03	506.000
2-Chloro-4-nitrobenzoic acid, potassium salt	03	508.030

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
4-Chloro-3-nitrobenzotrifluoride	03	508.100
2-Chloro-4-nitrotoluene	03	512.000
5-Chloro-2-pentanone	15	811.000
2-Chlorophenothiazine	03	519.000
1-(4-Chlorophenoxy)-3,3-dimethyl-1-(1,2,4-triazol-1-yl)-butan-2-one	13	40.009
α-(2-Chlorophenyl)- -(4-chlorophenyl)-5-pyrimidine-methanol	13	40.020
o-Chlorophenylcyclopentyl ketone	03	522.300
N-(4-Chlorophenyl)-N'-(3,4-dichlorophenyl)urea	03	523.100
4-Chloro-o-phenylenediamine	03	523.000
α-(2-Chlorophenyl)-α -(4-fluorophenyl)-5-pyrimidine-methanol	13	40.019
β-(4-Chlorophenyl)methyl-α -(1,1-dimethylethyl)-1,2,4-triazole-1-ethanol	13	168.994
2-(2-Chlorophenyl)methyl-4,4-dimethyl-3-isoxazolinone	13	118.067
Chlorophenyl trichlorosilane	15	33.950
4-Chlorophthalic acid	03	528.000
1-Chloropinacolone	15	812.320
3-Chloro-1,2-propanediol (Glycerol α-chlorohydrin)	15	1076.000
Chloro-2-propanone (Chloroacetone)	15	813.000
3-Chloropropene (Allyl chloride)	15	1229.000
1-(3-Chloropropyl)-4-methylpiperazine	03	530.000
α-Chloropropyltrichlorosilane	15	1379.000
Chloropropyltrimethoxysilane	15	1380.000
3-Chloropropyl-2,5-xylyl ether	03	530.070
2-Chloropyridine	03	532.000
2- 4 (6-Chloro-2-quinoxalinyl)oxy]phenoxy]propionil acid ethyl ester (Quizalofod ethyl)	13	76.060
4-Chlororesorcinol	03	537.000
5-Chlorosalicylic acid	03	537.400
Chlorosulfonated polyethylene (CSM) type	10	9.100
2-(4-Chlorosulfonylphenyl)ethyltrichlorosilane	03	539.200
Chlorosulfurized sperm oil	14	197.000
7-Chloro-1,2,3,4-tetrahydro-2-methyl-3-(2-methylphenyl)-4-oxo-6-quinozolenesulfonamide	03	539.500
Chlorothiaxanthone	15	34.600
Chlorothiazide	06	719.000
o-Chlorotoluene	03	543.000
α-Chlorotoluene (Benzyl chloride)	03	545.000
3-Chloro-p-toluidine NH_2=1	03	547.000
2-Chloro-6-(trichloromethyl)pyridine	13	168.991
Chlorotrifluoroethylene (Trifluorovinyl chloride)	15	1258.000
2-Chloro-1,1,2-trifluoroethyl methyl ether	15	1259.200
Chlorotrifluoromethane (F 13)	15	1259.000
2-Chloro-N-[[[4-(trifluoromethoxy) phenyl]amino]carbonyl] benzamide	13	133.200
3-(2-Chloro-4-trifluoromethylphenoxy)toluene	03	556.050
4-Chloro-α,α,α -trifluoro-3-nitrotoluene	03	557.000
p-Chloro-α,α, α-trifluorotoluene	03	558.000
6-Chloro-α, α,α -trifluoro-m-toluidine	03	559.000
Chlorotrimethylsilane	15	1381.000
4-Chloro-3,5-xylenol	03	565.000
Chlorphenesin carbamate	06	477.000
Chlorpheniramine maleate	06	89.000
Chlorpheniramine tannate	06	90.000
Chlorpromazine hydrochloride	06	484.000
Chlorpropamide	06	687.000
Chlortetracycline (medicinal grade)	06	31.000
Chlortetracycline (animal feed grade)	06	64.000
Cholecalciferol (vitamin D_3)	06	811.000
Choleretics and hydrocholeretics, all other	06	604.000
Cholesterol esterase	14	110.000
Cholesterol oxidase	14	122.000
Choline	15	342.000
Choline bicarbonate	06	605.000
Choline bitartrate	06	606.000
Choline chloride (animal feed grade)	06	607.000
Choline chloride (medicinal grade)	06	608.000
Choline citrate	06	610.000
Choline dihydrogen citrate	06	611.000
Choline magnesium salicylate	06	385.300
Chromium acetate	15	592.000
Chromium 2-ethylhexanoate	15	632.500
Chromium naphthenate	14	299.000
Cimetidine	06	619.400
Cimetidine hydrochloride	06	619.600
Cineole eucalyptol	07	23.700
Cinnamaldehyde	07	24.000
Cinnamic aldehyde dimethyl acetal	07	24.200
Cinnamonitrile	15	34.780
Cinnamyl acetate	07	25.000
Cinnamyl alcohol	07	26.000
Cinnamyl butyrate	07	27.100
Cinnamyl cinnamate	07	27.200
Cinnamyl nitrile	07	27.500
Cinnamyl propionate	07	28.000
Cinoxacin	06	276.002
Cisplatin	06	278.200
Citral dimethyl acetal	07	127.700
Citric and acetylcitric acid esters, all other	11	71.000
Citric acid	15	505.000
Citric acid salts, all other	15	627.000
Citric acid, sodium salts (50%) in sodium phosphates (20%)	12	53.500
Citronellyl acetate	07	128.000
Citronellyl formate	07	130.000
Citronellyl isobutyrate	07	131.000
Citronellyl propionate	07	131.500
Clindamycin	06	45.000
Clorazepate dipotassium	06	498.000
Clorsulon	06	116.500
Cloxacillin, sodium	06	13.000
Cobalt acetate	15	593.000
Cobalt t-α-alkylcarboxylate	15	669.000
Cobalt 2-ethylhexanoate	15	633.000
Cobaltic acetylacetonate	15	1281.600

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
Cobalt manganese acetate	15	593.010
Cobalt manganese tallate	15	172.010
Cobalt naphthenate	14	301.000
Cobalt neodecanoate	15	705.000
Cobalt-potassium 2-ethylhexanoate	15	633.010
Cobalt stearate	15	753.000
Cobalt tallate	15	172.000
N-Cocoalkyl-1,3-propylenediamine acetate	13	245.011
Cocoamidoamphoglycinate	12	9.250
3-Cocoamido-N,N-dimethyl propylamine oxide	12	385.285
N-(Cocoamidopropyl;N,N-acetic acid) ammonium salt	12	482.600
Cocoamidopropyl betaine	12	9.255
Cocoamidopropyl dimethyl amine	12	328.300
Cocoamidopropyl dimethyl amine oxide	12	385.280
N-Cocoamido-propyl-N,N-dimethylamine oxide	12	9.580
3[-3-(Cocoamidopropyl)dimethylammonio]-2-hydroxypropane sulfonate	12	9.600
3-Cocoamidopropyl-2-hydroxy-3-sulfopropyldimethyl ammonium hydroxide, inner salt	12	9.700
Cocoamphocarboxyglycinate	12	9.260
Cocoamphocarboxypropionate	12	9.265
Cocoamphopropionate	12	9.280
Cocodimethyl ethyl ammonium ethyl sulfate	12	482.750
Coconut oil acids	12	569.000
Coconut oil acids (Ratio = 1/1)	12	564.000
Coconut oil acids (Ratio = 2/1)	12	532.000
Coconut oil acids (Ratio = 1/1)	12	546.000
Coconut oil acids (Ratio = 2/1)	12	556.000
Coconut oil acids	12	554.000
Coconut oil acids, diethanolamine salt	12	29.100
Coconut oil acids-dimethylaminopropylamine condensate (amine/acid ratio = 1/1)	12	586.480
Coconut oil acids-ethanolamine condensate, ethoxylated	12	576.000
Coconut oil acids, ethanolamine salt	12	29.200
Coconut oil acids-ethanolamine salt, sulfated, potassium salt	12	248.000
Coconut oil acids and oleic acid, potassium salt	12	55.700
Coconut oil acids, potassium salt	12	54.000
Coconut oil acids, sodium salt	12	55.000
Coconut oil acids, 2-sulfoethyl ester, sodium salt	12	198.000
N-(Coconut oil acyl)-N-methyltaurine, sodium salt	12	183.000
N-(Coconut oil acyl)sarcosine, sodium salt	12	40.000
Coconut oil alcohol, ethoxylated	12	735.000
N-(Coconut oil alkyl)-β-alanine, partial sodium salt	12	10.100
N-(Coconut oil alkyl)-β-alanine, sodium salt	12	10.000
3-(Coconut oil alkyl)amidoethylene-(2-hydroxyethyl) aminopropionic acid	12	10.130
(Coconut oil alkyl)amine	12	418.000
(Coconut oil alkyl)amine, ethoxylated	12	326.000
(Coconut oil alkyl)amine, ethoxylated, acetate	12	327.000
Coconut oil(alkyl)amine, ethoxylated and phosphated	12	327.100
Coconut oil alkyl amine, propoxylated	12	327.550
N-(Coconut oil alkyl)aminobutyric acid, sodium salt	12	483.000
(Coconut oil alkyl)bis(2-hydroxyethyl, ethoxylated)-methylammonium chloride	12	456.000
(Coconut oil alkyl)-bis-(hydroxyethyl)methyl ethoxylated mono- (2-carboxyethyl)ether methyl sulfate, potassium salt	12	456.025
N-(Coconut oil alkyl)trimethylenediamine	12	407.000
Coconut oil amide	15	232.000
Coconut oil, ethoxylated	12	669.200
Coconut oil fatty acid polyoxyethylene	12	456.100
Coconut oil, sulfated, sodium salt	12	306.000
Coconut oil and tallow acids(Ratio = 2/1)	12	533.000
Cocoyl amidopropyl dimethylamine oxide	12	327.600
Cocoyl chloride	15	505.500
Codeine	06	429.000
Cod oil, sulfated, sodium salt	12	298.000
Colestipol hydrochloride	06	614.500
Complex glycerol esters, all other	12	651.000
Complex linear polyesters and polymeric plasticizers, all other	11	132.000
Copolyurethane urea	14	386.000
Copper acetate	15	594.000
Copper t-α-alkylcarboxylate	15	669.050
Copper 2-ethylhexanoate	15	634.000
Copper gluconate	06	762.000
Copper naphthenate	14	302.000
Copper oleate	15	718.000
Copper, [2,2',2'',2'''-[z9H,31H- phthalacyaninepentylpentakis (methylene)]pentakis[1H- isoindole-1,3(2H)-dionato]]	03	568.603
Corn oil acids, potassium salt	12	56.000
Corticotropin	06	692.000
Cortisone acetate	06	653.000
Coumarin	07	29.000
Coumarone-indene resins	08	22.000
Creosote oil (Dead oil)creosote content in solution (100 Percent basis)	01	21.000
Creosote oil (Dead oil)creosote in coal tar solution (100 Percent solution basis)	01	20.000
Creosote oil (Dead oil)distillate as such (100 Percent creosote basis)	01	19.000
m-Cresol	03	569.000
p-Cresol	03	572.000
o-Cresol, from petroleum	03	571.000
(m,p)-Cresol, from petroleum	03	574.000
Cresolsulfonic acid, formaldehyde condensate	15	34.830
m-Cresyl acetate	06	258.500
Cresyl glycidyl ether	15	35.500
Cresyl glycidyl ether	15	34.900
Cresylic acid (Less than 75 percent distilling over 215 C)	02	12.000
Cresylic acid, refined; from petroleum	03	580.000
Crotonaldehyde	15	786.000
Crotonic acid (2-Butenoic acid)	15	506.000
Crude acetate mixture (Linalyl,neryl,geranyy acetates, main components)	07	162.100
Crude coal tar	01	0.500
Crude coal tar solvent	01	22.030
Crude light oil	01	1.000
Crude tar acid oils having a tar acid content of all other	01	17.000

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
Crude tar acid oils having a tar acid content of 5 percent to less than 24 percent	01	15.000
Cumene (Isopropyl benzene)	03	581.000
Cumene hydroperoxide	15	35.000
Cumenesulfonic acid	03	581.500
Cumenesulfonic acid, ammonium salt	12	144.000
Cumenesulfonic acid, sodium salt	12	144.100
Cuminyl acetate	07	29.200
Cuminyl alcohol	07	29.300
Cuminyl formate	07	29.400
α-Cumyl peroxyneodecanoate	15	35.400
Cumyl phenolate isopropoxy titanium salt	12	776.500
2-Cyanoacetamide	15	233.000
Cyanoacetic acid (Malonic nitrile)	15	438.600
4-(Cyanoacetyl)morpholine	03	582.200
Cyanocobalamin (animal feed grade)	06	795.000
Cyanocobalamin (U.S.P. crystalline)	06	797.000
1-(2-Cyanoethyl)ethyl urea	15	349.000
Cyano(4-fluoro-3-phenoxyphenyl)methyl-3-(2,2-dichloroethenyl)-2,2-dimethylcyclopropanecarboxylate	13	166.050
N-Cyano-s-methyl-N-2(4-methyl-5-imidazolyl)-methylthioethylisothiourea	03	584.213
Cyano-3-phenoxybenzyl-cis, trans-3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropane carboxylate	13	166.049
Cyano(3-phenoxyphenyl)methyl-4-chloro-α-(1-methylethyl) benzeneacetate	13	166.024
Cyanuric acid	15	36.000
Cyclacillin	06	13.500
Cyclic amphoteric surface-active agents, all other	12	28.000
Cyclic chemicals, all other	15	218.000
Cyclic elastomers, all other	10	6.000
Cyclic fungicides, all other	13	40.000
Cyclic herbicides, all other	13	118.000
Cyclic insecticides, all other	13	166.000
Cyclic intermediates, all other	03	1554.000
Cyclic plasticizers, all other	11	58.000
Cyclic silizane	15	36.250
Cyclized polyisoprene (Cyclorubber)	10	0.500
Cyclobenzaprine hydrochloride	06	477.500
Cyclohexane	03	586.000
Cyclohexane carbonitrile	15	36.280
1,4-Cyclohexanedicarboxylic acid	03	588.100
1,2-Cyclohexanedicarboxylic acid anhydride	03	588.000
Cyclohexane dimethanol diglycidyl ether	15	36.300
Cyclohexanesulfamic acid (Cyclamic acid)	07	82.000
Cyclohexanesulfamic acid, sodium salt (Sodium cyclamate)	07	84.000
Cyclohexanethiol	15	36.800
Cyclohexanol	03	589.000
Cyclohexanone	03	590.000
Cyclohexanone oxime	03	591.000
Cyclohexene	03	592.000
4-Cyclohexene-1,2-dicarboxylic anhydride	03	594.000
2-Cyclohexene-1-octanoic acid, 5 (and 6)-carboxy-4-hexyl, $C_{21}H_{36}O_4$	15	39.500
Cyclohexene oxide	03	594.100
β-(1-Cyclohexenyl)ethylamine	03	594.296
Cycloheximide	06	65.000
Cyclohexylamine	03	595.000
N-Cyclohexyl-2-benzothiazolesulfenamide	09	26.000
3-Cyclohexyl-6-(dimethylamino)-1-methyl-1,3,5-triazine-2,4-(1H,3H)-dione	13	118.019
1,4-Cyclohexylenedimethanol	15	41.000
Cyclohexyl isooctyl phthalate	11	23.200
Cyclohexyl methacrylate	15	41.200
Cyclohexylmethyldimethoxysilane	03	597.300
N-Cyclohexyl-N-palmitoyltaurine, sodium salt	12	182.000
N-Cyclohexyl-N'-phenyl-p-phenylenediamine	09	58.000
Cyclohexyl salicylate	07	95.270
N-(Cyclohexylthio)phthalimide	09	124.250
Cyclooctadiene	03	597.800
Cyclopentane	02	11.000
Cyclopentanone	07	95.250
(2-Cyclopenten-1-yl)-2-propanone	03	601.000
Cyclopropene carboxylic acid, 3-(2-chloro-3,3,3-trifluoro-1-propenyl)-2,2-dimethyl-(2-methyl1,1'- biphenyl-3-yl) methyl ester	03	601.500
α-Cyclopropyl-α-(p-methoxyphenyl)-5-pyrimidine methanol (Ancymidol)	13	168.140
2-Cyclopropylmethylamino-5-chlorobenzophenone	03	601.780
2-(N-Cyclopropylmethyl-N-phthalimidoacetyl)-amino-5-chlorobenzophenone	03	601.800
Cycloserine	06	5.000
Cyclosols	02	4.010
p-Cymene	03	602.000
Cypermethrin	13	166.029
Cyproheptadine hydrochloride	06	91.000
Cytarabine	06	278.300
Danazol	06	692.500
Decabromodiphenyl ether (DBDP)	15	43.005
Decahydronaphthalene (Decalin)	15	44.000
trans-Decahydro-β-naphthyl acetate	07	29.710
Decanal (Capraldehyde)	07	132.000
1-Decanamine, N,N-didodecyl	12	432.850
n-Decane	15	1337.000
1-Decanol	15	850.500
Decanoyl chloride	15	507.000
Decanoyl peroxide	15	1291.000
Decyl acetate	07	132.500
Decyl alcohol, ethoxylated	12	727.000
Decyl alcohol, ethoxylated and phosphated	12	76.200
Decyl alcohol, ethoxylated and phosphated, potassium salt	12	76.205
Decyl alcohol, ethoxylated and propoxylated	12	727.010
n-Decyl mercaptan	09	170.800
Decyl and octyl alcohols, ethoxylated	12	736.000
Decyl and octyl phosphate	12	92.000
Decyl oleate	11	90.300
Decyloxypoly(ethyleneoxy)ethyl chloride	12	728.000

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
Decyl polyphosphate, sodium salt	12	95.000
Decyl sulfate, sodium salt	12	218.000
7-Dehydrocholesterol (provitamin D_3)	06	812.000
Dexamethasone	06	654.000
Dexamethasone acetate	06	654.500
Dexamethasone sodium phosphate	06	655.000
Dexbrompheniramine maleate	06	92.000
Dexpanthenol	06	789.000
Dextran	06	637.000
Dextroamphetamine sulfate	06	517.000
Dextromethorphan hydrobromide	06	430.000
3-Diacetoxyethylaminobenzanilide	03	605.600
Diagnostic agents, other than roentgenographic contrast media, all other	06	582.000
Dialkylbenzene	03	608.200
Dialkyldithiocarbamic acid derivative	09	127.950
Di(C_5-C_6 alkyl)naphthalenesulfonic acid	12	162.500
Diallylamine	15	258.100
N,N-diallyl-2,2-dichloroacetamide	13	175.013
Diallyldimethyl ammonium chloride	15	349.200
Diallyl isophthalate	08	4.030
Diallyl maleate	15	913.000
Di-amine derivatives of dimer acids	15	349.300
Diamines and polyamines, all other	12	417.000
1,3 Diaminocyclohexane	03	618.100
4,4-Diaminodiphenyl ether	15	45.840
4,4'-Diaminodiphenyl sulfone	03	629.100
2,6-Diaminopyridine	03	634.000
Diammonium dithiodiglycolate	15	627.400
Di-tert-amyl-phenyl acid phosphate	14	157.000
2,5-Dianilinoterephthalic acid	03	640.000
Diarylenediamines, mixed	09	59.000
Diatrizoate, sodium	06	564.000
1,8-Diazabicyclo (5.4.0)undecane	15	46.600
1,4-Diazobicyclo(2.2.2)octane	15	47.000
4-Diazo-2,5-diethoxymorpholinobenzene	14	336.000
Diazoxide	06	355.500
2,5-Di(benzoyl peroxy)-2,5-dimethylhexane	15	49.000
Dibenzylamine	09	40.000
Dibenzyldithiocarbamic acid, sodium salt	09	9.000
Dibenzyldithiocarbamic acid, zinc salt	09	10.000
m-Dibromobenzene	03	658.000
1,2-Dibromo-2,2-dichloroethyl dimethyl phosphate (Naled)	13	217.000
1,2-Dibromo-2,4-dicyanobutane	13	195.012
Dibromodifluoromethane	15	1260.000
(1,2-Dibromoethyl)benzene	03	659.300
Dibromoethyldibromocyclohexane	03	659.500
Dibromomethane (methylene bromide)	15	1213.000
2,6-Dibromo-4-nitroaniline	03	660.100
2-4-Dibromo-6-nitro-m-cresyl methyl ether	07	29.750
2,3-Dibromopropanol	15	1296.700
Dibucaine	06	702.000
Dibucaine hydrochloride	06	703.000
Dibutoxy acetophenone	15	50.500
p-Dibutoxybenzene (DBB)	03	665.100
Di(2-(2-butoxyethoxy)ethyl) adipate	11	59.000
Dibutoxyethyl adipate	11	59.200
Di(2-butoxyethyl) phthalate	11	24.000
Dibutoxyethyl sebacate	11	111.900
2,5-Dibutoxy-4-morpholinobenzenediazonium sulfate salt (DBB Sulfate)	03	666.100
2,5-Dibutoxy-4-morpholinonitrobenzene	03	666.200
Di-n-butylamine	15	262.000
4,4'-Di-sec-butylaminodiphenylmethane	14	156.000
2-Dibutylaminoethanol	15	350.000
2-(4-Dibutylamino-2-hydroxycarbonyl)benzoic acid	03	666.400
Dibutylaminomethanol	15	350.500
3-(Dibutylamino)phenol	03	666.450
Dibutyl butylphosphonate	15	1022.000
Dibutyl-p-cresol	03	666.600
2,6-Di-tert-butyl-p-cresol, (BHT), Food grade	15	51.000
2,6-Di-tert-butyl-p-cresol, (BHT), Technical grade	15	52.000
2,5-Di-sec-butyldecylhydroquinone	09	88.400
Di-t-butyl diperoxyphthalate	15	53.200
Di-tert-butyl disulfide	02	92.000
Dibutyldithiocarbamic acid, nickel salt	09	128.100
Dibutyldithiocarbamic acid, sodium salt	09	128.000
Dibutyldithiocarbamic acid, zinc salt	09	130.000
Di-tert-butylethyldiamine	15	267.800
Dibutyl hydrogen phosphite	15	1023.000
2,5-Di-tert-butylhydroquinone	15	53.000
Di-n-butylmagnesium	15	1374.200
Dibutyl maleate	15	916.000
Dibutylnaphthalenesulfonic acid	12	163.000
1,1-Di(t-butyl peroxy) cyclohexane	15	50.530
Di(sec-butyl)peroxydicarbonate	15	1291.500
1,1-Di(t-butyl peroxy)-3,3,5-trimethyl cyclohexane	15	50.540
2,4-Di-tert-butylphenol	03	667.000
2,4-Di-t-4-sec.-butylphenol	15	53.350
2,6-Di-tert-butylphenol	03	860.050
2,6-Di-tert-4-sec-butylphenol	03	846.900
N,N'-Di-sec-butyl-p-phenylenediamine	14	180.000
Dibutyl phthalate (including diisobutyl phthalate)	11	25.000
Dibutyl pyrophosphate	15	1023.500
Dibutyl sebacate	11	112.000
Dibutyltin bis(isooctylmercaptoacetate)	15	1401.200
Dibutyltin bis(mercaptolaurate)	15	1402.000
Dibutyltin diacetate	15	1402.300
Dibutyltin dichloride	15	1402.500
Dibutyltin dilaurate	15	1402.600
Dibutyltin dilaurate	15	677.500
Dibutyltin maleate	15	687.000
Dibutyltin oxide	15	1404.000
Di-n-butylxantho disulfide	09	152.000
N-(1,2-Dicarboxyethyl)-N-octadecylsulfosuccinamic acid, tetrasodium salt	12	177.000
2,2-Dichloroacetyl chloride	15	507.500
3,4-Dichloroaniline	03	670.000
3,6-Dichloro-2-anisic acid (Dicamba)	13	50.000
o(and p)-Dichlorobenzene	03	678.000
o-Dichlorobenzene	03	677.000

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
m-Dichlorobenzene	03	676.000
p-Dichlorobenzene	03	679.000
3,3'-Dichlorobenzidine base and salts	03	682.000
2,6-Dichlorobenzonitrile	13	51.100
3,4-Dichlorobenzotrifluoride	03	683.150
3,5-Dichlorobenzoyl chloride	03	684.050
2,4-Dichlorobenzyldimethyl(mixed alkyl)ammonium chloride	12	519.900
2,4-Dichlorobenzyltributylphosphonium chloride	13	168.150
2,4-Dichloro-6-(o-chloroanilino)-s-triazine	13	3.000
2,2-Dichloro-1,1-difluoroethyl methyl ether	15	1308.000
Dichlorodifluoromethane (F-12)	15	1262.000
4,6-Dichloro-1,3-dihydroxybenzene	03	687.500
1,4-Dichloro-2,5-dimethoxybenzene (Chloroneb)	13	4.000
1,3-Dichloro-5,5-dimethylhydantoin	15	54.000
Dichlorodimethylsilane	15	1382.000
Dichlorodiphenylsilane	03	690.000
1,2-Dichloroethane (Ethylene dichloride)	15	1233.000
2,6-Dichloro-3-methylaniline	03	694.050
Dichloromethylphenylsilane	03	696.000
Dichloromethylsilane	15	1383.000
Dichloromethylvinylsilane	15	1384.000
2,6-Dichloro-4-nitroaniline	03	697.000
1,2-Dichloro-4-nitrobenzene	03	698.000
2,4-Dichloro-5-nitrotrifluoromethylbenzene	03	699.900
2,4-Dichlorophenoxyacetic acid (2,4-D)	13	86.000
2,4-Dichlorophenoxyacetic acid, sec-butyl ester	13	90.000
2,4-Dichlorophenoxyacetic acid, dimethylamine salt	13	91.000
2,4-Dichlorophenoxyacetic acid, ethanolamine and isopropanolamine salts	13	92.000
2,4-Dichlorophenoxyacetic acid, iso-octyl ester	13	95.000
2,4-Dichlorophenoxyacetic acid, isopropyl ester	13	96.000
2-(2,4-Dichlorophenoxy)propionic acid, dimethylamine salt	13	118.052
2-(2,4-Dichlorophenoxy)propionic acid, isooctyl ester	13	118.060
3-(3,4-Dichlorophenyl)-1,1-dimethylurea (Diuron)	13	53.000
O-(2,4-Dichlorophenyl) O-ethyl S-propyl phosphorodithioate	13	165.013
3-(3,4-Dichlorophenyl)-1-methoxy-1-methylurea (Linuron)	13	54.000
2-(3,4-Dichlorophenyl)-4-methyl-1,2,4-oxadiazolidine-3,5-dione (Methazole)	13	118.036
(E)-3-(2,4-Dichlorophenyl)-2-(2-nitro-4-trifluoromethylphenyl)propenoic acid	03	701.600
1[(2,4-Dichlorophenyl)4-propyl-1,3-dioxolan-2-ylmethyl-]1H-1,2,4-triazole	13	118.065
2-(3,5-Dichlorophenyl)-2-(2,2,2-trichloroethyl) oxirane (tri	13	118.069
1,2-Dichloropropane (Propylene dichloride)	15	1235.000
1,3-Dichloro-2-propanol	15	1296.750
1,3-Dichloropropene	13	238.000
2,3-Dichloropropene	15	1236.000
3',4'-Dichloropropionanilide(Propanil)	13	56.000
2,2-Dichloropropionic acid,sodium salt (Dalapon)	13	201.000
2,6-Dichloropyridine	03	703.500
3,7-Dichloro-8-quinolinic acid	13	118.070
Dichlorotetrafluoroethane	15	1263.000
p,α-Dichlorotoluene	03	708.000
Dicloxacillin, sodium	06	14.000
Dicocodimethyl ammonium methyl sulfate	12	483.400
Dicresylphosphorodithioic acid	14	130.000
Dicresylphosphorodithioic acid, ammonium salt	14	131.000
Dicresylphosphorodithioic acid, sodium salt	14	132.000
Dicumyl peroxide	15	56.500
Dicyandiamide resins	08	4.050
Dicyanodiamide formaldehyde ammonium chloride polymer	14	477.000
1,1-Dicyclohexane	15	56.950
Dicyclohexylamine	03	712.000
Dicyclohexylamine, nitrate salt	03	712.100
Dicyclohexyl phthalate	11	27.000
Dicyclopentadiene (includes Cyclopentadiene)	03	714.000
Dicyclopentadienylchromium (Chromocene)	15	57.800
Didecyl adipate	15	917.000
Didecyldimethylammonium chloride	12	483.500
2,5-Di-(1,1-dimethylpropyl)hydroquinone	09	89.000
Diesel fuel additives, acyclic, all other	14	151.000
Diesel fuel additives, cyclic, all other	14	152.000
Diethanolamine	15	380.000
Diethanolamine condensate, all other	12	555.000
Diethanolamine condensates (Amine/acid = 2/1), all other	12	545.000
Diethanolamine condensates, amine/acid ratio=1/1, all other	12	553.000
α,α-Diethoxyacetophenone	03	716.200
p-Diethoxybenzene	03	718.000
Diethoxyethane	15	1308.500
2,5-Diethoxy-4-morpholinobenzenediazonium chloride	14	338.000
2,5-diethoxy-4-morpholinonitrobenzene	03	666.250
Diethylaluminum chloride	15	1356.000
Diethylaluminum dimethylethyl siloxide	15	1356.100
Diethyl aluminum ethoxide	15	1356.200
Diethylaluminum iodide	15	1357.000
Diethylamine	15	277.000
p-(Diethylamino)benzaldehyde	03	721.000
p-Diethylaminobenzenediazonium chloride (p-Diazo-N, N- diethylaniline zinc chloride)	14	340.000
2-Diethylaminoethanol (N,N-Diethylethanolamine)	15	355.000
2-(2-Diethylaminoethoxy)ethanol	15	356.000
2-Diethylaminoethyl acrylate	15	357.000
Diethylaminoethylacrylate, dimethyl sulfate, quaternary salt	15	357.100
2-Diethylaminoethyl methacrylate	15	358.000
24-Diethylamino-2-hydroxybenzylbenzoic acid	03	722.503
4-(Diethylamino)-2-methylbenzaldehyde	03	723.500
3-Diethylamino-6-methyl-7-(2,4-dimethylanilino) fluoran	15	57.280
o-(2-(Diethylamino)-6-methyl (4-pyrimidinyl) o,o-dimethyl phosphrothioate	13	152.600
3-(4'-N,N-Diethylamino)phenylazo-1H-1,2,4-triazole	03	724.100
3-(Diethylamino)propiophenone	03	725.000
N,N-Diethylaniline	03	727.000
2,6-Diethylaniline	03	727.200

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
Diethylbenzene	03	729.000
Diethylcarbamazine citrate	06	118.000
Diethylcarbamoyl chloride	15	359.000
Diethyl carbonate (Ethyl carbonate)	15	922.000
N,N-Diethylcyclohexylamine	03	730.000
O,O-Diethyl O-(2-diethylamino-6-methyl-4-pyrimidinyl) phosphorothioate	13	166.034
3,5-Diethyl-1,2-dihydro-1-phenyl-2-propylpyridine	03	730.600
N,N'-Diethyl-N,N'-diphenylurea	15	57.400
Diethyldithiocarbamic acid, cadmium salt and bis (diethylthiocarbamoyl)disulfide, mixture	09	132.000
Diethyldithiocarbamic acid, selenium salt	09	134.000
Diethyldithiocarbamic acid, sodium salt	09	135.000
Diethyldithiocarbamic acid, tellurium salt	09	136.000
Diethyldithiocarbamic acid, zinc salt	09	137.000
N,N-Diethyldodecanamide	15	235.000
Diethylene glycol	15	1153.000
Diethylene glycol adipate	15	1100.800
Diethylene glycol, borated	15	1101.000
Diethylene glycol chloroformate	15	1102.000
Diethylene glycol dibenzoate	11	1.300
Diethylene glycol dimethacrylate	15	1103.000
Diethylene glycol distearate	12	604.000
Diethylene glycol divinyl ether	15	1153.350
Diethylene glycol monoester of coconut oil acids	12	605.000
Diethylene glycol monoester of tall oil acids	12	605.800
Diethylene glycol monoester of tallow acids	12	606.000
Diethylene glycol monolaurate	12	607.000
Diethylene glycol mono-n-propyl ether	15	1154.000
Diethylene glycol monostearate	12	610.000
Diethylene glycol phthalate	11	27.500
Diethylene glycol sesquiester of tall oil acids	12	611.000
Diethylene glycol sesquilaurate	12	612.000
Diethylene glycol terephthalate	12	614.200
Diethylenetriamine	15	269.800
Diethylenetriamine, alkoxylated	12	327.680
(Diethylenetriamine)pentamethylenephosphonic acid	14	31.000
(Diethylenetriamine)pentamethylenephosphonic acid, sodium salt	14	32.000
(Diethylenetrinitrilo)pentaacetic acid	14	33.000
(Diethylenetrinitrilo)pentaacetic acid, monosodium hydrogen ferric salt	14	34.000
(Diethylenetrinitrilo)pentaacetic acid, pentasodium salt	14	35.000
O,O-Diethyl S-2-[(ethylthio)ethyl] phosphorodithioate (Disulfoton)	13	218.000
O,O-Diethyl S-[(ethylthio)methyl] phosphorodithioate (Phorate)	13	221.000
Diethylglycol amine (DEGA)	15	359.700
Di(2-ethylhexyl) adipate	11	60.000
Di(2-ethylhexyl) azelate	11	67.000
Di(2-ethylhexyl)chlorendate	15	57.500
Di(2-ethylhexyl) isophthalate	11	33.950
Di(2-ethyl-1-hexyl) maleate	15	928.000
Di-(2-ethylhexyl) peroxydicarbonate	15	1292.000
Diethylhexyl phosphoric acid	15	1024.200
Di-2-ethylhexylphosphorodithioic acid	14	233.000

Chemical name	Sect. No.	Item No.
Di(2-ethylhexyl) phthalate	11	34.000
Di(2-ethylhexyl) sebacate	11	113.000
Diethyl hydrogen phosphite	15	1026.000
Diethylhydroxylamine	15	360.000
Diethyl isophthalate	11	27.900
Diethyl maleate	15	930.000
O,O-Diethyl 0-[4-(methylsulfinyl)phenyl]phosphorothioate	13	165.011
Diethyl oxalate (Ethyl oxalate)	15	934.000
N,N-Diethyl-p-phenylenediamine	03	738.000
O,O-Diethyl-o-phenyl phosphorothioate	15	57.600
Diethyl phosphenothionic dichloride	15	1026.900
Diethyl phosphorochloridothionate	15	1027.000
Diethyl phthalate	11	28.000
Diethylpropion hydrochloride	06	544.000
Diethyl sebacate	07	133.000
Diethyl succinate	07	134.000
Diethyl sulfide (Ethyl sulfide)	02	92.810
1,5-Diethyl-2-thio-4,6-pyrimidinedione	15	57.750
1,3-Diethyl-2-thiourea	15	361.000
N,N-Diethyltoluamide (DEET)	13	148.000
3,5-Diethyltoluene-2,4-diamine	03	828.500
N,N-Diethyl-m-toluidine	03	739.000
N,N-Diethyl-p-toluidine	03	739.500
O,O-Diethyl 0-3,5,6-trichloro-2-pyridyl phosphorothioate	13	156.100
3,9-Diethyl-6-tridecyl sulfate, sodium salt	12	242.000
Diethylzinc	15	1408.000
Diflorasone diacetate	06	655.400
Diflunisal	06	385.500
1,1-Difluoroethane	15	1264.000
Difunctional epoxy acrylate	15	1154.400
Diglycol dimerate	15	968.976
Di-(n-heptyl-n-nonyl) phthalate	11	28.900
Di-(n-heptyl-n-nonyl) undecyl phthalate	11	28.925
Di-n-hexyl adipate	11	60.600
Dihexyl fumarate	07	134.020
Di-n-hexyl magnesium	15	1374.500
Dihydrocarvone	07	134.050
Dihydrocoumarin	07	29.780
6,11-Dihydrodibenz(b,e)oxepin-11-one	03	740.500
2,3-Dihydro-2,2-dimethyl-7-benzofuranol	03	744.100
2,3-Dihydro-2,2-dimethyl-7-benzofuranyl[(dibutylamino) thio]methyl carbamate	13	148.300
2,3-Dihydro-2,2-dimethyl-7-benzofuranyl methyl-carbamate	13	148.400
2,3-Dihydro-5,6-dimethyl-1,4-dithiin-1,1,4,4-tetraoxide	13	168.996
2-2-(2,3-Dihydro-1,3-dioxo-1H-inden-2yl)-[(quinolinyl)]-6-methylbenzothiazole-7-sulfonic acid	03	752.600
Dihydrolinalool	07	136.500
1,3-Dihydro-4(or 5)-methyl-2H-benzimidazole-2-thione	09	41.450
2,3-Dihydro-2-[6-methyl-7-sulfo-2-benzothiazolyl]-2-quinolinyl-1,3-dioxo -1H-indene-5-carboxylic acid	03	756.500
Dihydro myrcenol	07	134.100
Dihydronordicyclopentadienyl acetate (Cyclacet)	07	95.330
Dihydronordicyclopentadienyl propionate (Cyclaprop) (Verdyl propionate extra)	07	95.470

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
Dihydro pentamethyl indanone	07	134.200
Dihydrostreptomycin	06	6.000
Dihydro terpineol	07	95.490
Dihydroterpinyl acetate	07	166.367
2,5-Dihydrothiophene-1,1-dioxide (Sulfolene)	15	58.000
1,2-Dihydro-2,2,4-trimethylquinoline	09	69.000
Dihydroxyaluminum aminoacetate	06	620.000
2,4-Dihydroxybenzaldehyde	03	768.200
3,4-Dihydroxybenzoic acid, methyl ester	03	768.500
2,4-Dihydroxybenzophenone	15	58.500
2,4-Dihydroxybenzophenone	03	769.100
Di(hydroxy)bis(ammoniumlactato)titanium	15	1059.500
2,2'-Dihydroxy-4,4'-dimethoxybenzophenone	15	59.000
2,3-Dihydroxy-2,2-dimethyl-7-benzofuranyl	13	166.052
Dihydroxydimethyl benzophenone	15	59.100
3,5-Dihydroxy-3,5,dimethyl-1,2-peroxycyclopentane	15	60.000
N,N-Di(hydroxyethyl)-n-carboxymethyl tallow ammonium quat, inner salt	12	10.320
N,N-Di(B-hydroxyethyl)-m-chloroaniline	03	771.300
N,N-Dihydroxyethylglycine, sodium salt	14	39.000
6,7-Dihydroxy-2-naphthalenesulfonic acid	03	774.000
Diiodomethane (Methylene iodide)	15	1277.000
Diiodomethyl-p-tolyl sulphone	15	63.000
Diisobutyl adipate	11	61.000
Diisobutyl alcohol	15	850.700
Diisobutylaluminum chloride	15	1358.000
Diisobutylaluminum hydride	15	1359.000
Diisobutylamine	15	263.000
Diisobutyl dimethoxychloro silane	15	1385.200
Di-isobutylene (Di-isobutene)	02	74.000
Di-isobutylene maleate	12	707.000
Diisobutyl-o-cresol	03	777.200
Diisodecyl adipate	11	62.000
Diisodecyl phthalate	11	30.000
Diisohexyl phthalate	11	30.050
Diisononanoyl peroxide	15	1293.570
Diisononyl adipate	11	62.500
Diisononyl phthalate	11	30.100
Diiso-octyl adipate	11	63.000
Diiso-octyl phthalate	11	35.000
Diisopropanolamine	15	408.000
m-Diisopropenylbenzene	03	777.500
Diisopropyl adipate	11	63.200
Diisopropylamine	15	286.000
2-Diisopropylaminoethanol (N,N-Diisopropylethanolamine)	15	362.000
2-Diisopropylaminoethyl methacrylate	15	363.000
Diisopropylaniline	03	778.000
Diisopropylbenzene	03	778.100
Diisopropylbenzene hydroperoxide	15	64.000
Diisopropyl dimerate	15	968.980
Diisopropyl hydrogen phosphite	14	272.000
Diisopropyl ketone (2,4-Dimethyl-3-pentanone)	15	817.000
Diisopropylnaphthalenesulfonic acid, sodium salt	12	166.000
N,N'-Diisopropyl-p-phenylenediamine	14	181.000
S-(O,O-Diisopropyl phosphorodithioate) ester of N-(α-mercaptoethyl)benzenesulfonamide (Bensulide)	13	58.000
Diisopropyl sebacate	11	114.100
Diisostearyl dimerate	15	968.985
Diketene	15	66.000
Dilauryl-3,3'-thiodipropionate	15	940.000
Dilevalol hydrochloride	06	355.650
Diltiazen hydrochloride	06	378.400
Dimenhydrinate	06	80.000
Dimer acid (C_{36} Aliphatic dibasic acid)	15	509.000
Dimeracidalkyl amine	12	419.300
N-(Dimeracidalkyl)trimethylenediamine	12	407.700
Dimer acid esters and polyesters	14	273.000
Dimethindene maleate	06	94.000
2,5-Dimethoxyaniline, ethoxylated	12	342.250
2,5-Dimethoxybenzaldehyde	03	783.000
m-Dimethoxybenzene	03	784.000
p-Dimethoxybenzene	03	784.500
p-Dimethoxybenzene (Dimethyl ether of hydroquinone)	15	67.000
Dimethoxyethane (Ethylene glycol dimethyl ether)	15	1155.000
1,1-Dimethoxy octane	07	129.690
3-(Dimethoxyphosphinyloxy)-N,N-dimethyl-cis-crotonamide	13	222.000
1,2-Dimethoxy-4-propenylbenzene (4-Propenylveratrole)	07	30.000
N,N-Dimethylacetamide	15	236.000
N,N-Dimethylacetoacetamide	15	236.500
O,S-Dimethylacetylphosphoramidothioate (Acephate)	13	222.500
Dimethyl adipate	11	63.225
N,N-Dimethyl-N-alkylamine phosphate	12	393.200
Dimethylamine	15	288.000
Dimethylamine epichlorohydrin copolymer	15	364.750
Dimethylamine epichlorohydrin ethylenediamine copolymer	14	417.000
p-Dimethylaminobenzenediazonium chloride (p-Diazo-N,N-dimethylaniline zinc chloride)	14	346.000
m-(Dimethylamino)benzoic acid	03	796.000
2-4-(Dimethylamino)benzoylbenzoic acid	03	796.500
2-Dimethylaminoethanethiol hydrochloride	15	365.000
2-Dimethylaminoethanol (N,N-Dimethylethanolamine)	15	366.000
Dimethylaminoethyl acrylate,dimethyl sulfate,quaternary salt	15	367.800
Dimethylaminoethylacrylate, methyl chloride, quaternary salt	15	367.900
Dimethylaminoethylmethacrylate	15	368.000
Dimethylaminoethylmethacrylate, dimethyl sulfate, quaternary salt	15	368.200
Dimethylaminoethylmethacrylate, methyl chloride, quaternary salt	15	369.000
Dimethylaminomethanol	15	369.500
2-Dimethylamino-2-methyl-1-propanol hydrochloride	15	369.600
m-Dimethylaminophenol	03	802.000
1-(Dimethylamino)-2-propanol	15	369.700
Dimethylaminopropylamine	15	274.000
Dimethylaminopropylamine,propoxylated	15	369.900

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
11-3(Dimethylamino)propyl-6H-hydroxydibenz(b,e)oxepin	03	803.000
Dimethylaminopropyl methacrylamide	15	236.780
Dimethylammonium hydrogen isophthalate	09	41.725
N,N-Dimethylaniline	03	805.000
2,6-Dimethylaniline	03	805.500
Dimethylarsinic acid (Cacodylic acid)	13	201.200
N,N-Dimethylbemenylarachidyl amine	12	432.970
N,N-Dimethylbenzylamine	03	809.000
1,1'-Dimethyl-4,4'-bipyridinium dichloride	13	118.049
2,2-Dimethylbutanol (isohexyl alcohol)	15	851.700
N,N-Dimethylbutylamine	15	274.995
N-(1,3-Dimethylbutyl)-N'-phenyl-p-phenylenediamine	09	59.310
N,N-Dimethyl capramide	12	40.350
Dimethyl carbonate	15	941.000
2,2-Dimethylchloropropane(neopentyl chloride)	15	1236.800
N,N-Dimethyl(coconut oil alkyl)amine	12	433.000
Dimethyl-1,4-cyclohexanedicarboxylate	03	811.500
β,4,Dimethyl-3-cyclohexene-1-propanal	07	30.501
γ,4-Dimethyl-3-cyclohexene-1-propanol	07	30.500
N,N-Dimethylcyclohexylamine	03	813.000
N,N-Dimethyldecylamine oxide	12	327.800
Dimethyldi(C_{12-18})ammonium chloride (mixed straight and branched chains)	12	485.780
2,5-Dimethyl-2,5-di(tert-butylperoxy)hexane	15	1295.000
2,5-Dimethyl-2,5-di(tert-butylperoxy)hexyne-3	15	1296.000
O,O-Dimethyl-O-2,2-dichlorovinyl phosphate (DDVP)	13	223.000
Dimethyldioctadecylammonium choride	12	486.000
N,N-Dimethyl-2,2-diphenylacetamide (Diphenamid)	13	59.000
4,4'-Dimethyldiphenyl ether	03	814.500
N,N'-Dimethyl-N,N'-diphenylurea	15	67.800
Dimethyldithiocarbamic acid, bismuth salt	09	138.000
Dimethyldithiocarbamic acid, copper salt	09	139.000
Dimethyldithiocarbamic acid, lead salt	09	140.000
Dimethyldithiocarbamic acid, potassium salt	13	181.100
Dimethyldithiocarbamic acid, potassium salt	09	174.000
Dimethyldithiocarbamic acid, selenium salt	09	141.000
Dimethyldithiocarbamic acid, sodium salt	09	175.000
Dimethyldithiocarbamic acid, sodium salt and sodium polysulfide	09	142.000
Dimethyldithiocarbamic acid, zinc salt	09	143.000
N,N-Dimethyldodecylamine	12	434.000
N,N-Dimethyldodecylamine oxide	12	327.910
Dimethyl dodecyl ethyl ammonium ether sulfate	12	456.500
4-(1,1-Dimethylethyl)cyclohexanol	07	134.400
2,5-Dimethyl-2,5-d1(2-ethylhexanoyl peroxy) hexane	15	1294.000
S-[(1,1-Dimethylethyl)thiomethyl]O,O-diethyl phosphorodithioate(Turbufos)	13	223.500
N,N-Dimethylformamide	15	237.000
N,N-Dimethylglycine	14	5.000
N,N-Dimethylglycine hydrochloride	14	6.000
2, 6-Dimethylheptan-2-ol	07	95.610
2,6 Dimethyl-5-hepten-1-al	07	134.500
N,N-Dimethylhexadecylamine	12	435.000
N,N-Dimethylhexadecylamine oxide	12	328.000
Dimethyl hexanediol	07	134.600
2,5-Dimethyl-3-hexyne-2,5-diol	07	134.650
5,5-Dimethylhydantoin	03	816.000
N,N-Dimethyl(hydrogenated tallow alkyl)amine	12	436.000
Dimethyl hydrogen phosphite	15	1028.000
Dimethyl isophthalate	11	31.500
Dimethyl isopropanolamine	15	408.100
Dimethyl maleate	15	943.000
Dimethyl methylphosphonate	15	1029.000
O,O-Dimethyl O-[4-(methylthio)-m-tolyl]phosphorothioate (Fenthion)	13	157.000
N,N-Dimethyl(mixed alkyl)amine	12	437.000
N,N-Dimethyl(mixed alkyl)amine oxide	12	328.100
2,6-Dimethylnaphthalene	03	819.750
Dimethyl-2,6-naphthalene dicarboxylate	15	67.850
N,N-Dimethyl(9-octadecenyl-alkyl)amine	12	437.500
N,N-Dimethyloctadecylamine	12	438.000
3,7-Dimethyl-trans-2,6-octadienal (Citral A; geranial)	07	134.850
3,7-Dimethyl-2,6-octadienal (citral a&b)	07	134.900
3,7-Dimethyl-2,6-octadienenitrile	07	140.350
3,7-Dimethyl-2,6-octadiene oxime	07	140.357
3,7-Dimethyl-cis-2,6-octadien-1-ol (Nerol)	07	135.000
3,7-Dimethyl-trans-2,6-octadien-1-ol (Geraniol)	07	138.000
3,7-Dimethyl-1,6-octadien-3-ol (Linalool) (Linalyl alcohol)	07	136.000
3,7-Dimethyl-cis-2,6-octadienol, acetate (Neryl acetate)	07	135.100
3,7-Dimethyl-1,6-octadien-3-ol,acetate (Linalyl acetate)	07	137.000
3,7-Dimethyl-1,6-octadien-3-yl formate	07	30.900
3,7-Dimethyl-1,6-octadien-3-yl isobutyrate (Linalyl isobutyrate)	07	139.000
3,7-Dimethyl-2,6-octadienyl phenylacetate (Geranyl phenylacetate)	07	31.000
3,7-Dimethyl-1,6-octadien-3-yl propionate (Linalyl propionate)	07	140.000
Dimethyloctanal	07	140.100
3,7-Dimethyloctanol-1 (Tetrahydrogeraniol)	07	140.450
3,7-Dimethyl-3-octanol	07	140.500
Dimethyloctanyl acetate	07	140.600
3,7-Dimethyl-6-octen-1-al (Citronellal)	07	141.000
3,7-Dimethyl-6-octenenitrile	07	141.030
3,7-Dimethyl-6-octene oxime	07	141.035
3,7-Dimethyl-6-octen-1-ol (Citronellol)	07	142.000
3,7-Dimethyl-7-octenol 70%, 6-octenol isomer 30%	07	142.100
Dimethyloldihydroxyethylene urea	14	479.000
Dimethyl oleamide	15	237.100
N,N-Dimethyl oleyl amine oxide	12	328.400
4,4-Dimethyl oxazolidene	15	67.900
O,O-Dimethyl S-(4-oxo-1,2,3-benzotriazin-3(3H)-yl) methylphosphorodithioate (Azinphos-methyl)	13	159.000
N,N'-Dimethyl-3,4,9,10-perylenetetracarboxylic acid 3, 4:9,10-diimide	03	821.500
α,α-Dimethylphenethyl acetate	07	32.000
Dimethyl phenylethyl carbinyl acetate	07	33.310
Dimethyl phosphate of 3-hydroxy-N-methyl-cis-crotonamide	13	225.000
O,S-Dimethyl phosphoramidothioate	13	229.012
Dimethyl phosphoridothionate	15	1030.000

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
Dimethyl phthalate	11	32.000
Dimethyl piperazine	15	62.700
1,1-Dimethylpiperidinium chloride	13	168.350
N,N-Dimethyl-1,3-propanediamine polymer with epichlorohydrin, sulfate	14	160.000
2,2-Dimethyl-1,3-propanediol (Neopentyl glycol)	15	1080.000
Dimethyl sebacate	11	114.900
Dimethyl(soya alkyl)ammonium ethyl sulfate	12	487.125
N,N-Dimethyl(soybean oil alkyl)amine	12	439.000
Dimethyl succinate	07	142.700
Dimethyl sulfide	02	92.820
Dimethyl sulfone	15	1309.150
N,N-Dimethyl(tallow alkyl)amine	12	439.500
Dimethyl-2,3,5,6-tetrachloroterephthalate (DCPA)	13	62.000
N,N-Dimethyltetradecylamine	12	440.000
Dimethyltetradecylamine oxide	12	328.130
N-[5-1,1-Dimethyl)-1,3,4-thiadiazol-2-yl]-N,N-dimethylurea (Tebuthiuron)	13	118.061
Dimethyltin dichloride	15	1404.200
Dimethyltin-IOTG	15	1404.210
N,N-Dimethyl-o-toluidine	03	827.800
N,N-Dimethyl-p-toluidine	03	828.000
N-[2,4-dimethyl-5-[[trifluoromethyl]sulfonyl]amino]phenyl]-acetamide, diethanolamine salt	13	168.375
1,1-Dimethyl-3-(α, α, α-trifluoro-m-tolyl)urea (Fluometuron)	13	118.040
Dimorpholine diethyl ether	15	68.279
Dimyristyl-3,3'-thiodipropionate	15	946.000
N,N'-Di-2-naphthyl-p-phenylenediamine	09	61.000
Dinitolmide	06	171.000
m-Dinitrobenzene	03	834.000
2,4-Dinitrobenzenesulfonic acid, sodium salt	03	835.100
3,5-Dinitrobenzoic acid	03	836.000
3,5-Dinitrobenzoyl chloride	03	837.000
Dinitrobutylphenol (DNBP)	13	63.000
Dinitrobutylphenol,triethanolamine salt	13	65.000
3,5-Dinitrochlorobenzenesulfonic acid, potassium salt	03	838.500
2,6-Dinitro-N,N-dipropyl cumidine	13	118.038
3,5-Dinitro-N_4;N_4-dipropylsulfanilamide	13	118.032
2,4-Dinitrophenol, tech.	03	840.000
2, 4-Dinitrophenoxyethanol	03	840.500
2,4-Dinitrophenyl dimethyldithiocarbamate	09	14.000
3,5-Dinitrosalicylic acid, methyl ester	03	842.200
p-Dinitrosobenzene	03	842.800
4,4'-Dinitrostilbene-2,2'-disulfonic acid	03	843.000
2,4-Dinitrotoluene	03	844.000
2,4(and 2,6)-Dinitrotoluene	03	845.000
3,5-Dinitro-p-toluenesulfonic acid	03	846.000
3,5-Dinitro-o-toluic acid	03	846.200
Dinonylhydroxybenzenesulfonic acid	03	846.400
Dinonylphenol	03	846.700
Dinonylphenol, ethoxylated	12	743.000
Dinonylphenol, ethoxylated and phosphated	12	76.300
Dinonyl phthalate	11	33.000
Dinoprostone	06	679.200
N,N'-Dioctadecyl-N,N'-diisopropyl thiuram disulfide	09	150.200
Di-n-octyl adipate	11	63.300
Di-n-octylaluminum iodide	15	1359.500
Dioctyl dimerate	15	969.020
N,N-Dioctyl-N,N-dimethyl ammonium chloride	12	487.150
Di-tert-octyl hydroquinone	15	71.200
Dioctyl maleate	15	947.000
Di-n-octyl phthalate	11	36.000
Dioctyl phthalates, all other	11	37.000
Dioctyl tin dilaurate	15	1404.430
Dioleic acid (Ratio = 1/2)	12	555.100
Dioleyl hydrogen phosphite	15	1031.000
Dioxane (1,4-Diethylene oxide)	15	72.000
1,3-Dioxolane	15	73.000
Di-para-benzoquinone dioxime	03	847.100
Di-para-xylene	15	74.066
Di-N,N'-pentamethylenethiuram tetrasulfide	09	42.000
Dipentylamine	15	295.000
2,4-Di-tert-pentylphenol	03	847.000
Diphenhydramine citrate	06	115.002
Diphenhydramine hydrochloride	06	95.000
1,2-Diphenoxyethane	15	73.200
Diphenoxylate	06	620.300
2-Diphenylacetyl-1,3-indandione and sodium salt	13	171.010
Diphenylamine	03	853.000
Diphenylamine-acetone aldehyde	09	52.700
Diphenylamine-acetone condensate	09	53.000
Diphenyl-t-butylhexyl phosphite	15	73.220
Diphenyldimethoxysilane	03	855.500
Diphenyl-4,4'-diphenylmethylenedicarbamate	09	124.350
Diphenyldisulfide	03	855.250
1-Diphenylhydrazone	03	856.500
Diphenylisodecyl phosphite	15	73.300
Diphenylisooctyl phosphite	15	73.340
Diphenylmercuric dodecenyl succinate	13	7.500
Diphenylmethane-4,4'-diisocyanate (MDI)	03	1020.000
N,N'-Diphenyl-p-phenylenediamine	09	62.000
Diphenyl phthalate	03	857.400
Diphenylsulfone sulfonic acid, potassium salt	12	210.700
1,3-Di-4-piperidylpropane	03	858.313
Dipropanediol dibenzoate (Dipropylene glycol dibenzoate)	11	4.000
Di-n-propylaluminum chloride	15	1359.400
Dipropylamine	15	300.000
Dipropylene glycol	15	1156.000
Dipropylene glycol monomethyl ether	15	1156.500
Dipropylene glycol salicylate	15	74.000
Di-n-propylisocinchomeronate	13	148.500
Di-n-propyl peroxydicarbonate	15	1296.300
Di-N-propylphosphorodithioic acid	14	234.000
Di(pyrrolidonylethyl)imine	12	328.435
Direct Black 22	04	613.000
Direct Black 80	04	623.000
Direct black 163	04	623.163
Direct Black 165	04	623.165
Direct Black 170	04	623.170

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
Direct black dyes, all other	04	625.000
Direct Blue 15	04	539.000
Direct Blue 22	04	540.000
Direct Blue 25	04	542.000
Direct Blue 75	04	547.000
Direct Blue 76	04	548.000
Direct Blue 80	04	550.000
Direct Blue 86	04	552.000
Direct Blue 98	04	555.000
Direct Blue 100	04	556.000
Direct Blue 108	04	557.108
Direct Blue 160	04	564.000
Direct Blue 189	04	565.000
Direct Blue 191	04	566.000
Direct Blue 199	04	567.000
Direct Blue 218	04	568.000
Direct Blue 269	04	570.269
Direct Blue 279	04	570.279
Direct Blue 281	04	570.281
Direct Blue 283	04	570.283
Direct Blue 286	04	570.286
Direct blue dyes, all other	04	571.000
Direct Brown 44	04	597.000
Direct Brown 231	04	606.231
Direct Brown 232	04	606.232
Direct Brown 238	04	606.238
Direct brown dyes, all other	04	607.000
Direct Green 92	04	586.092
Direct green dyes, all other	04	587.000
Direct Orange 6	04	457.000
Direct Orange 8	04	458.000
Direct Orange 15	04	461.000
Direct Orange 26	04	462.000
Direct Orange 34	04	464.000
Direct Orange 39	04	466.000
Direct Orange 72	04	470.000
Direct Orange 80	04	475.000
Direct Orange 102	04	479.000
Direct Orange 118	04	479.118
Direct orange dyes, all other	04	480.000
Direct Red 2	04	482.000
Direct Red 4	04	483.000
Direct Red 9	04	483.009
Direct Red 16	04	488.000
Direct Red 23	04	490.000
Direct Red 24	04	491.000
Direct Red 26	04	492.000
Direct Red 72	04	499.000
Direct Red 73	04	500.000
Direct Red 80	04	504.000
Direct Red 81	04	505.000
Direct Red 83	04	506.000
Direct Red 236	04	521.236
Direct Red 238	04	521.238
Direct Red 239	04	521.239
Direct Red 254	04	521.254

Chemical name	Sect. No.	Item No.
Direct red dyes, all other	04	522.000
Direct Violet 9	04	525.000
Direct Violet 66	04	531.000
Direct Violet 99	04	532.099
Direct Yellow 4	04	421.000
Direct Yellow 5	04	422.000
Direct Yellow 6	04	423.000
Direct Yellow 11	04	427.000
Direct Yellow 28	04	433.000
Direct Yellow 34	04	435.000
Direct Yellow 44	04	438.000
Direct Yellow 51	04	439.051
Direct Yellow 105	04	445.000
Direct Yellow 106	04	446.000
Direct Yellow 107	04	447.000
Direct Yellow 118	04	450.000
Direct Yellow 119	04	451.000
Direct Yellow 127	04	453.000
Direct Yellow 131	04	454.000
Direct Yellow 132	04	454.132
Direct Yellow 133	04	454.133
Direct Yellow 137	04	454.137
Direct Yellow 147	04	454.147
Direct Yellow 148	04	454.148
Direct yellow 154	04	454.154
Direct yellow dyes, all other	04	455.000
N,N'-Disalicylidene-1,2-propanediamine	14	161.000
Disodium cyanodithioimidocarbonate	13	179.000
Disopyramide phosphate	06	378.500
Disperse Black 9	04	751.000
Disperse Black 33	04	752.000
Disperse black dyes, all other	04	753.000
Disperse Blue 3	04	716.000
Disperse Blue 27	04	719.000
Disperse Blue 56	04	722.000
Disperse Blue 60	04	723.000
Disperse Blue 62	04	725.000
Disperse Blue 64	04	727.000
Disperse Blue 73	04	729.000
Disperse Blue 79	04	731.000
Disperse Blue 95	04	734.000
Disperse Blue 102	04	735.000
Disperse Blue 118	04	739.000
Disperse Blue 122	04	739.122
Disperse Blue 148	04	742.148
Disperse Blue 183	04	743.183
Disperse Blue 200	04	743.200
Disperse Blue 281	04	743.281
Disperse Blue 284	04	743.284
Disperse Blue 291	04	743.291
Disperse Blue 333	04	743.333
Disperse Blue 337	04	743.337
Disperse Blue 338	04	743.338
Disperse blue 359	04	743.359
Disperse blue 360	04	743.360
Disperse blue dyes, all other	04	744.000

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
Disperse Brown 1	04	746.000
Disperse Brown 18	04	747.018
Disperse Brown 22	04	747.022
Disperse brown 26	04	747.026
Disperse brown 27	04	747.027
Disperse Green 9	04	745.009
Disperse Orange 3	04	653.000
Disperse Orange 17	04	656.000
Disperse Orange 25 and 25:1	04	658.000
Disperse Orange 29	04	659.000
Disperse Orange 30	04	660.000
Disperse Orange 33	04	660.033
Disperse Orange 37	04	661.000
Disperse Orange 41	04	662.000
Disperse Orange 44 and 44:1	04	663.000
Disperse Orange 73	04	667.073
Disperse Orange 89	04	668.089
Disperse Orange 94	04	668.094
Disperse Orange 136	04	668.136
Disperse Orange 138	04	668.138
Disperse Orange 145	04	668.145
Disperse orange dyes, all other	04	669.000
Disperse Red 1	04	670.000
Disperse Red 5	04	672.000
Disperse Red 13	04	676.000
Disperse Red 17	04	678.000
Disperse Red 30	04	680.000
Disperse Red 50	04	683.000
Disperse Red 55	04	684.000
Disperse Red 60	04	686.000
Disperse Red 65	04	687.000
Disperse Red 73	04	688.000
Disperse Red 74	04	688.074
Disperse Red 91	04	692.091
Disperse Red 135	04	695.135
Disperse red 145	04	699.145
Disperse Red 153	04	699.153
Disperse Red 159	04	700.000
Disperse Red 167 and 167:1	04	700.167
Disperse Red 177	04	701.000
Disperse Red 179	04	702.000
Disperse Red 195	04	703.195
Disperse Red 263	04	703.263
Disperse Red 274	04	703.274
Disperse Red 278	04	703.278
Disperse Red 305	04	703.305
Disperse Red 307	04	703.307
Disperse Red 309	04	703.309
Disperse Red 311	04	703.311
Disperse Red 313	04	703.313
Disperse Red 316	04	703.316
Disperse Red 325	04	703.325
Disperse Red 333	04	703.333
Disperse Red 338	04	703.338
Disperse Red 339	04	703.339
Disperse Red 340	04	703.340
Disperse Red 341	04	703.341
Disperse Red 345	04	703.345
Disperse red 358	04	703.358
Disperse red dyes, all other	04	704.000
Disperse Violet 1	04	705.000
Disperse Violet 17	04	707.017
Disperse Violet 28	04	710.000
Disperse Violet 33	04	710.033
Disperse Violet 36	04	710.036
Disperse Violet 48	04	713.048
Disperse Violet 60	04	713.060
Disperse Violet 91	04	713.091
Disperse Yellow 3	04	628.000
Disperse Yellow 23	04	631.000
Disperse Yellow 34	04	635.000
Disperse Yellow 42	04	636.000
Disperse Yellow 54	04	638.000
Disperse Yellow 64	04	639.064
Disperse Yellow 77	04	642.000
Disperse Yellow 86	04	644.000
Disperse Yellow 88	04	646.000
Disperse Yellow 108	04	650.108
Disperse Yellow 114	04	650.114
Disperse Yellow 126	04	651.126
Disperse Yellow 198	04	651.198
Disperse Yellow 219	04	651.219
Disperse Yellow 238	04	651.238
Disperse Yellow 239	04	651.239
Disperse yellow dyes, all other	04	652.000
Distearyldimethyl ammonium methosulfate	12	456.550
Distearyl-3,3'-thiodipropionate	15	949.000
Distinnaxane, hexakis (2-methyl-2-phenylpropyl)	13	166.011
Disulfuram	06	832.000
N,N'-(Di-tall oil acid)amidoethylamine	12	385.500
Ditallowamidoammonium sulfate	12	487.500
Di-tertiary nonylpolysulfide	14	257.000
2',2'''-Dithiobis(benzanilide)	09	115.000
2,2'-Dithiobis[benzothiazole]	09	29.000
Dithiobis (stearyl propionate)	15	950.000
2,5-Dithiobiurea	15	376.000
Dithiocarbamic acid derivatives, acyclic, other	09	144.000
Dithiodiglycolic acid	15	513.080
4,4'-Dithiodimorpholine	09	43.000
Dithiodipropionic acid	15	513.100
2,5-Di-p-toluidinoterephthalic acid	03	865.100
Di-tridecyl adipate	11	63.400
Ditridecyl maleate	15	951.000
Di-tridecyl phthalate	11	39.000
Di(tridecyl)-3,3'-thiodipropionate	15	952.000
Diundecyl phthalate	11	39.300
1,5-diureidonaphthalene	03	865.800
Divinylbenzene	03	866.000
Divinyl tetramethyldisiloxane	15	1385.500
1,1-Di-3,4-xylylethane	03	1553.200
Dobutamine	06	326.200
1-Docosanol (behenyl alcohol 22 carbons)	15	852.300

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
Docosanyl docosenoate	15	969.050
N-(Docosyl and eicosyl)trimethylenediamine	12	408.300
Docusate, calcium	06	591.700
Docusate, potassium	06	591.720
Docusate, sodium	06	591.740
n-Dodecane	15	1338.000
Dodecanedioic acid	15	514.000
Dodecane nitrile	07	143.930
Dodecene	02	78.000
Dodecenyl-acetic succinimide	14	247.000
Dodecenyl succinic acid, benzotriazole salt	14	276.000
Dodecenylsuccinic anhydride	15	165.600
Dodecyl alcohol (Lauryl alcohol)	15	872.000
Dodecyl alcohol, ethoxylated	12	729.000
Dodecyl alcohol, ethoxylated and phosphated	12	77.000
Dodecyl alcohol, ethoxylated and polyphosphated	12	78.000
Dodecyl alcohol, ethoxylated and sulfated, ammonium salt	12	270.000
Dodecyl alcohol, ethoxylated and sulfated, sodium salt	12	271.000
Dodecylamine	12	420.000
Dodecylbenzene, other	03	870.000
Dodecylbenzene, straight-chain	03	869.000
Dodecylbenzene sulfonates, all other	12	128.000
Dodecylbenzenesulfonic acid	12	114.000
Dodecylbenzenesulfonic acid, (Mixed alkyl)amine salt	12	122.000
Dodecylbenzenesulfonic acid, ammonium salt	12	115.000
Dodecylbenzenesulfonic acid, calcium salt	12	117.000
Dodecylbenzenesulfonic acid, diethanolamine salt	12	118.000
Dodecylbenzenesulfonic acid, ethylenediamine salt	12	119.000
Dodecylbenzenesulfonic acid, isopropanolamine salt	12	120.000
Dodecylbenzenesulfonic acid, isopropylamine salt	12	121.000
Dodecylbenzenesulfonic acid, monoethanolamine salt	12	122.500
Dodecylbenzenesulfonic acid, oleyl amine, ethoxylated, salt	12	122.700
Dodecylbenzenesulfonic acid, potassium salt	12	123.000
Dodecylbenzenesulfonic acid, sodium salt	12	125.000
Dodecylbenzenesulfonic acid, triethanolamine salt	12	127.000
Dodecyldiphenyloxidedisulfonic acid	12	205.990
Dodecyldiphenyloxidedisulfonic acid, disodium salt	12	206.000
Dodecyl disodium banaline, N-(2-carboxyethyl), sodium salt	12	10.420
n-Dodecylguanidine acetate (Dodine)	13	188.000
Dodecylguanidine hydrochloride	13	195.011
N-Dodecyl-3-iminodipropionic acid	12	10.500
N-Dodecyl-3-iminodipropionic acid, disodium salt	12	11.000
N-Dodecyl-3-imino-dipropionic acid, monosodium salt	12	11.020
tert-Dodecyl mercaptan, ethoxylated	12	759.000
n-Dodecyl mercaptans	09	171.000
Dodecylnitrobenzene	03	872.000
4-(Dodecyloxy)-2-hydroxybenzophenone	15	75.000
Dodecyloxypoly(ethyleneoxy)acetic acid, sodium salt	12	40.400
Dodecylpentadecyl methacrylate	15	952.700
p-Dodecylphenol	03	873.000
Dodecylphenol, ethoxylated	12	744.000
Dodecylphenol, ethoxylated and phosphated	12	79.000
Dodecylphenol, sulfurized, calcium salt	14	228.000
Dodecylphenyl-α-naphthylamine	14	277.000
Dodecylphenyl-α-naphthylamine, dioctyl diphenylamine co-polymer	14	278.000
Dodecyl pyridinium chloride	15	74.460
1-Dodecylpyridinium chloride	12	526.000
Dodecyl succinic anhydride	14	204.000
Dodecylsuccinic anhydride	15	165.620
Dodecyl succinic lactate	15	952.800
Dodecyl sulfate, ammonium salt	12	221.000
Dodecyl sulfate, diethanolamine salt	12	222.000
Dodecyl sulfate, N,N-diethylcyclohexylamine salt	12	223.000
Dodecyl sulfate, isopropanolamine salt	12	224.000
Dodecyl sulfate, magnesium salt	12	225.000
Dodecyl sulfate, potassium salt	12	226.000
Dodecyl sulfate, sodium salt	12	227.000
Dodecyl sulfate, triethanolamine salt	12	228.000
Dodecyl sulfoacetate, sodium salt	12	199.100
Dodecyl and tetradecyl alcohols, ethoxylated and sulfated, ammonium salt	12	273.000
Dodecyltrimethylammonium chloride	12	489.000
Doxapram hydrochloride	06	550.001
Doxepin hydrochloride	06	527.000
Doxylamine succinate	06	96.000
Drug and Cosmetic Green 5	04	793.000
Drug and Cosmetic Green 6	04	794.000
Drug and Cosmetic Green 8	04	796.000
Drug and Cosmetic Orange 4	04	797.000
Drug and Cosmetic Orange 5	04	798.000
Drug and Cosmetic Orange 17	04	799.000
Drug and Cosmetic Red 6	04	800.000
Drug and Cosmetic Red 7	04	801.000
Drug and Cosmetic Red 9	04	802.000
Drug and Cosmetic Red 17	04	807.000
Drug and Cosmetic Red 19	04	808.000
Drug and Cosmetic Red 21	04	809.000
Drug and Cosmetic Red 27	04	811.000
Drug and Cosmetic Red 30	04	813.000
Drug and Cosmetic Red 33	04	815.000
Drug and Cosmetic Red 34	04	816.000
Drug and Cosmetic Red 36	04	817.000
Drug and Cosmetic Violet 2	04	819.000
Drug and Cosmetic Yellow 7	04	822.000
Drug and Cosmetic Yellow 10	04	823.000
Edrophonium chloride	06	575.700
Eicosane	02	79.000
Enalapril maleate	06	360.100
Enflurane	06	436.500
Epichlorohydrin	15	1310.000
Epichlorohydrin bisphenol A, ethoxylated	12	744.500
Epichlorohydrin elastomers (CO, ECO) type	10	1.000
Epoxides, ethers, acetals, all other	15	1325.000
Epoxidized esters, all other	11	80.000
Epoxidized linseed oils	11	75.400
Epoxidized pentaerythritol tetraphthalate	11	75.800
Epoxidized soya oils	11	76.000
Epoxy,resins advanced	08	6.000

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
Epoxy,resins unmodified	08	5.000
Ergocalciferol (vitamin D_2)	06	813.000
Erucamide	15	238.000
[Erucyl alkyl]amine	12	420.500
Erucyl stearamide	15	239.250
Erythromycin	06	46.000
Erythromycin estolate	06	46.500
Erythromycin stearate	06	46.700
Erythromycin succinate	06	46.800
Erythromycin thiocyanate	06	46.900
Esters of sulfated oleic acid, all other	12	263.000
Estradiol cypionate	06	674.500
Estrogens, all other	06	679.000
Estrogens, conjugated	06	675.000
Estrogens, esterified	06	676.000
Ethacrynic acid	06	739.000
Ethanaminium, 2-hydroxy-N,N-bis(2-hydroxyethyl) -N-methyl-, salt with silicic acid	12	456.700
Ethanolamine condensates, amine/acid ratio = 2/1, all other	12	563.000
Ethanoldiglycine, disodium salt	14	43.000
5-Ethanoxy-3-trichloromethyl-1,2,4-thiadiazole	03	873.700
Ethchlorvynol	06	468.000
Ethers and thioethers, all other	12	775.000
Ethisterone	03	873.800
Ethopabate	06	172.000
Ethosuximide	06	419.000
Ethotoin	06	420.000
N-(p-ethoxycarbonylphenyl)-n'-ethyl-n' -phenylformamidine	07	34.200
6-Ethoxy-12-dihydro-2,2,4-trimethyl quinoline	15	76.500
2-Ethoxyethanol (Ethylene glycol monoethyl ether)	15	1159.000
2-(2-Ethoxyethoxy)ethanol (Diethylene glycol monoethyl ether)	15	1160.000
2-[2-(2-Ethoxyethoxy)ethoxy]ethanol (Triethylene glycol monoethyl ether)	15	1161.000
2-(2-Ethoxyethoxy)ethyl acetate	15	1105.000
2-Ethoxyethyl acetate	15	953.000
Ethoxylated acetic acid, sodium salt	12	318.100
Ethoxylated anhydrosorbitol esters, all other	12	624.000
Ethoxylated anhydrosorbitol monolaurate	12	616.000
Ethoxylated anhydrosorbitol mono-oleate	12	617.000
Ethoxylated anhydrosorbitol monopalmitate	12	618.000
Ethoxylated anhydrosorbitol monostearate	12	619.000
Ethoxylated anhydrosorbitol monotallate	12	619.100
Ethoxylated anhydrosorbitol triester of tall oil acids	12	621.000
Ethoxylated anhydrosorbitol trioleate	12	622.000
Ethoxylated anhydrosorbitol tristearate	12	623.000
Ethoxylated 1,3-butylene glycol stearate	12	707.820
Ethoxylated castor oil, ditridecylmaleate	12	707.900
Ethoxylated glycerol mono- and diesters of hydrogenated tallow acids	12	708.800
Ethoxylated glycerol and propylene glycol esters of coco fatty acids	12	708.780
Ethoxylated hydantoin glycol dicocoate	14	162.000
Ethoxylated(hydrogenated tallow amine), methyl ammonium chloride	12	458.100
Ethoxylated nonylphenol laurate	12	714.630
Ethoxylated 1,2-propanediol monostearate	12	711.000
Ethoxylated and propoxylated glycerol mono- and diesters of tallow acids	12	708.700
Ethoxylated, quaternized reaction product of formaldehyde and tallow diamine	12	458.250
Ethoxylated sorbitol beeswax ester	12	625.000
Ethoxylated sorbitol hexaester of tall oil acids	12	627.000
Ethoxylated sorbitol hexaoleate	12	628.000
Ethoxylated sorbitol lanolin ester	12	629.000
Ethoxylated sorbitol mono-oleate	12	630.000
Ethoxylated sorbitol monostearate	12	631.000
Ethoxylated sorbitol oleate, acetylated	12	631.500
Ethoxylated sorbitol pentalaurate	12	633.000
Ethoxylated sorbitol tetraester of lauric and oleic acids	12	635.000
Ethoxylated sorbitol tetraester of tall oil acids	12	636.000
Ethoxylated sorbitol tetraoleate	12	636.400
Ethoxylated sorbitol tetrastearate	12	636.500
Ethoxylated tallow amine, potassium propionate derivative	12	458.500
1-Ethoxy-3-methylbenzene	03	877.700
4-Ethoxy-2-methyl-N-phenylaniline	03	877.900
3-Ethoxypropionitrile	15	440.000
Ethyl acetate (100% basis)	15	954.001
Ethyl acetoacetate	15	955.000
Ethyl acrylate	15	956.000
Ethyl acrylate methacrylic acid copolymer	14	419.000
Ethyl alcohol, phosphated, amine salt	12	96.700
Ethyl alcohol, synthetic only	15	853.000
Ethylaluminum dichloride	15	1360.000
Ethylaluminum sesquichloride	15	1361.000
Ethylamine, mono-	15	278.000
2-Ethylaminoethanol (Ethylmonoethanolamine)	15	385.000
2-(Ethylamino)-4-(isopropylamino)-6-(methylthio) -s-triazine (Ametryne)	13	69.000
o-Ethylaniline	03	882.500
N-Ethylaniline, refined	03	883.000
2-(N-Ethylanilino)ethanol	03	884.000
3-(N-Ethylanilino)propionitrile	03	886.000
α-(N-Ethylanilino)-m-toluenesulfonic acid	03	887.000
Ethyl anthranilate	07	35.800
Ethylbenzene	03	892.000
Ethyl benzoate	07	35.900
(Ethylbenzyl)dimethyl(mixed alkyl)ammonium chloride	12	527.000
N-Ethyl-N,N-bis(polyoxyethylene)tallow ammonium ethyl sulfate	12	458.850
Ethyl butyrate	07	144.000
Ethyl caprate	07	144.100
Ethyl cellulose	08	21.030
Ethyl chloride (Chloroethane)	15	1223.000
Ethyl chloroformate	15	959.000

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
Ethyl 2-[[[[(4-chloro-6-methoxypyrimidin-2-yl)-amino] carbonyl]amino]sulfonyl]benzoate (Chlorimuron ethyl)	13	69.025
Ethyl chlorothiolformate	15	959.600
Ethyl cinnamate	07	36.000
Ethyl cyanoacetate	15	387.000
Ethyl-2-cyano-3,3-diphenyl acrylate	15	77.800
2-(N-Ethyl-N, β-cyanoethyl)-4-acetaminoanisole	03	895.100
Ethyl cyclohexylamine	15	78.100
S-Ethyl cyclohexylmethyethiocarbamate	13	69.100
Ethyl 3,3-di(t-butyl peroxy) butyrate	15	1296.320
S-Ethyl diisobutylthiocarbamate (Butylate)	13	202.500
Ethyldimethyl(mixed alkyl)ammonium ethyl sulfate	12	490.000
S-Ethyl dipropylthiocarbamate (EPTC)	13	202.000
Ethylene	02	40.000
Ethylene-acrylic acid resins (EAA)	08	31.900
Ethylene bis(dithiocarbamic acid),disodium salt (Nabam)	13	183.000
Ethylene bis(dithiocarbamic acid), manganese salt with zinc ions	13	184.500
Ethylene bis(dithiocarbamic acid), zinc and manganese salts	13	187.010
N,N'-Ethylenebis-oleamide (Oleic acid-ethylenediamine condensate (Amine/acid ratio = 1/2))	15	240.000
N,N'-Ethylenebis(stearamide)	15	241.000
Ethylene bis tetrabrom	15	1212.800
Ethylene carbonate	15	961.000
Ethylene/chlorotrifluoro ethylene copolymer (Halar)	08	38.230
Ethylenediamine	15	280.000
Ethylenediamine dihydriodide	06	583.000
Ethylene diamine ethoxlated	12	328.455
Ethylene dibromide	14	182.000
(Ethylenedinitrilo)tetraacetic acid (Ethylenediaminetetraacetic acid) (EDTA)	14	47.000
(Ethylenedinitrilo)tetraacetic acid, calcium disodium salt	14	49.000
(Ethylenedinitrilo)tetraacetic acid, diammonium salt	14	50.000
(Ethylenedinitrilo)tetraacetic acid, dipotassium salt	14	51.500
(Ethylenedinitrilo)tetraacetic acid, disodium copper salt, dihydrate	14	54.000
(Ethylenedinitrilo)tetraacetic acid, disodium salt	14	53.000
(Ethylenedinitrilo)tetraacetic acid, disodium zinc salt, dihydrate	14	56.000
(Ethylenedinitrilo)tetraacetic acid, magnesium salt	14	57.000
(Ethylenedinitrilo)tetraacetic acid, manganese salt	14	58.000
(Ethylenedinitrilo)tetraacetic acid, monoammonium ferric salt	14	59.000
(Ethylenedinitrilo)tetraacetic acid, monosodium iron salt	14	60.000
(Ethylenedinitrilo)tetraacetic acid, tetraammonium salt	14	61.000
(Ethylenedinitrilo)tetraacetic acid, tetrapotassium salt	14	62.000
(Ethylenedinitrilo)tetraacetic acid, tetrasodium salt	14	63.000
(Ethylenedinitrilo)tetraacetic acid, trisodium salt	14	64.000
1,1-Ethylenediurea	15	388.200
Ethylene glycol	15	1081.000
Ethylene glycol adipate	11	63.450
Ethylene glycol diacetate	15	1106.000
Ethylene glycol diacrylate	15	1106.200
Ethylene glycol dimercaptoacetate	15	1107.000
Ethylene glycol dimethacrylate	15	1108.000
Ethylene glycol distearate	12	638.000
Ethylene glycol di-tributyl ether	15	1161.700
Ethylene glycol di-tri-ethyl ether	15	1161.760
Ethylene glycol esters, all other	12	642.000
Ethylene glycol mono-oleate	12	639.000
Ethylene glycol monostearate	12	640.000
Ethylene glycol sesquistearate	12	641.000
Ethylene oxide	15	1312.000
Ethylene-propylene copolymer	14	279.000
Ethylene-propylene (EP) type	10	10.000
Ethylene-vinyl acetate (EVA) copolymer resins	08	31.700
Ethyl-α,β-epoxy-β-methylhydrocinnamate	07	37.000
Ethyl ether, absolute	15	1313.000
Ethyl ethers of tetra and higher ethylene glycols (high boiling)	15	1161.400
Ethyl 3-ethoxy propionate	15	961.100
Ethyl formate	07	144.500
α-Ethyl furfuryl alcohol	15	81.900
Ethyl furoate	07	95.700
4-Ethyl guaiacol	07	95.710
1-Ethyl-2-(8-heptadecenyl)-1-(2-hydroxyethyl) -2-imidazolinium ethyl sulfate	12	460.000
Ethyl heptanoate	07	145.000
Ethylhexadecyldimethylammonium bromide	12	493.000
N-Ethyl-N-hexadecylmorpholinium ethyl sulfate	12	461.000
S-Ethyl-hexahydro-1H-azepine-1-carbothioate (Molinate)	13	70.000
2-Ethylhexanal (α-Ethylcaproaldehyde)	15	789.000
2-Ethyl-1,3-hexanediol	15	1082.000
Ethyl hexanoate	07	146.000
2-Ethylhexanoic acid (α-Ethylcaproic acid)	15	519.000
2-Ethylhexanoic acid salts, all other	15	646.000
2-Ethyl-1-hexanol	15	854.000
2-Ethylhexanol and ethoxylated nonylphenol, polyphosphated	12	80.090
2-Ethylhexanol and ethoxylated nonylphenol, polyphosphated, sodium salt	12	80.100
2-Ethylhexanol, ethoxylated and phosphated	12	80.000
2-Ethylhexanol, ethoxylated, phosphated,potassium salt	12	80.050
2-Ethylhexanoyl chloride	15	520.000
2-Ethyl-1-hexyl acetate	15	962.000
2-Ethyl-1-hexyl acrylate	15	963.000
2-Ethylhexyl acrylate-methy acrylate copolymer resins	08	19.970
(2-Ethylhexyl)amine, mono-	15	281.000
2-Ethylhexyl benzoate	15	79.000
N-(2-Ethylhexyl)bicyclo(2.2.1)-5-heptene -2,3-dicarboximide	13	173.000
2-Ethylhexyl chloride	15	1237.000
2-Ethylhexyl chloroformate	15	963.600
2-Ethylhexyl-2-cyano-3,3-diphenyl acrylate	15	79.050
2-Ethylhexyl cyclohexyl phthalate	11	39.400

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
2-Ethylhexyl-1-p-dimethylaminobenzoate	15	79.100
2-Ethylhexyl epoxytallates	11	77.000
2-Ethylhexyl glycidyl ether	15	1317.500
2-Ethylhexyl hydrogen phosphate	15	1032.000
2-Ethyl-1-hexyl methacrylate	15	964.000
2-Ethylhexyl-p-methoxy cinnamate	07	37.100
2-Ethylhexyl-p-methoxy cinnamate	15	79.300
2-Ethylhexyl oleate	11	90.600
2-Ethylhexyl palmitate	11	96.900
2-Ethylhexyl phosphate	12	96.800
2-Ethylhexyl phosphate, potassium salt	12	96.900
2-Ethylhexyl phosphate, sodium salt	12	97.000
2-Ethylhexyl polyphosphate, sodium salt	12	99.000
2-Ethyl hexyl salicylate	07	37.400
2-ethylhexyl stearate	15	969.090
2-Ethylhexyl stearate	11	119.000
2-Ethylhexyl sulfate, sodium salt	12	243.000
p-[Ethyl(2-hydroxyethyl)amino]benzenediazonium chloride-diazo-n-hydroxyethylaniline zinc chloride)	14	352.000
5-(N-Ethyl-N-hydroxyethylamino)-2-pentanone	15	392.000
(N-Ethyl-N-(2-hydroxyethyl)-3-methyldehydrogen sulfate) p-phenylenediamine	14	353.000
N-Ethyl-N-hydroxyethyl-p-phenylenediamine sulfate	14	354.000
2-Ethyl-2-(hydroxymethyl)-1,3-propanediol (Trimethylolpropane)	15	1083.000
Ethylidine norbornene	15	80.000
Ethyl isobutyrate	07	146.450
Ethyl isovalerate	07	146.500
Ethyl laurate	07	147.000
Ethyl mercaptan (Ethanethiol)	02	93.000
2-(Ethylmercapto)ethanol	15	1327.000
Ethyl methacrylate	15	964.400
N-Ethyl-2-methylallylamine	15	281.500
6-Ethyl-2-methylaniline	03	897.000
Ethyl-2-methyl butyrate	07	147.700
Ethyl-2 methyl pentanoate	07	147.760
2-[Ethyl(3-methylphenyl)amino]ethanol	03	897.200
N-[3-(1-Ethyl-1-methylpropyl)-5-isoxazolyl]-2,6-dimethoxybenzamide (Flexidor)	13	118.062
O-Ethyl O-[4-(methylthio)phenyl] S-propyl phosphorodithioate	13	165.012
7-Ethyl-2-methyl-4-undecyl sulfate, sodium salt	12	244.000
4-Ethylmorpholine	15	81.000
Ethyl myristate	07	148.000
2-Ethyl-2-nitro-1,3-propanediol	15	392.250
Ethyl 2(2-nitro-4-trifluoromethylphenyl)-3-oxobutanoate	03	899.800
Ethyl nonanoate	07	149.000
Ethyl octanoate	07	150.000
Ethyl phenylacetate	07	37.800
N-Ethyl-N-phenylbenzylamine	03	901.000
Ethyl(polyoxyethylene, cocoamine) ethylsulfate	12	458.830
Ethyl propionate	07	150.200
N-(1-Ethylpropyl)-3,4-dimethyl-2,6-dinitrobenzenamine	13	118.030
3-Ethylpyridine	03	907.200
5-Ethyl-2,3-pyridinedicarboxylic acid	03	907.500
N-Ethyl pyrrolidone	15	81.300
Ethyl salicylate	07	39.000
N-Ethyl-N-(soybean oil alkyl)morpholinium ethyl sulfate	12	463.000
Ethyl succinyl chloride	15	1327.300
Ethyl sulfate (Diethyl sulfate)	15	966.000
N-Ethyl-p-toluenesulfonamide	11	5.000
N-Ethyl-m-toluidine	03	908.000
3-(N-Ethyl-m-toluidino)propionitrile	03	911.000
Ethyl trimethyl cyclopentenyl buterol	07	150.250
Ethyl 3,7,11-trimethyldodeca-2,4-dienoate	13	231.016
Ethyl valerate	07	150.300
Ethyl vinyl ether	15	1316.000
1-Ethynyl-1-cyclohexanol	03	913.000
Etidronate, disodium	06	837.001
Expandable polystyrene beads	08	44.010
External Drug and Cosmetic Orange 3	04	827.000
External Drug and Cosmetic Yellow 7	04	829.000
Famotioine	06	620.400
Fats and oils, chemically modified, all other	15	1331.000
Fatty acid, alkanolamine ester	15	392.500
Fatty acid amide mixtures	15	242.100
Fatty acid esters, not included with plasticizers surface-active agents, all other	15	981.000
Fatty acid polyamine condensate	14	280.000
fatty acid residues	15	1434.300
Fatty acids, hydrogenated	15	521.000
Fatty acids, mixed chain length, synthetic	15	522.001
Fatty acids, non-hydrogenated	15	522.000
Fatty acids, partially hydrogenated	15	523.000
Fatty amines	15	282.000
Fenoprofen	06	401.200
Fentanyl citrate	06	401.250
Fish oil, C_{14}-C_{22} menhaden, lead salts	15	646.700
Flavoxate hydrochloride	06	745.500
Flotation reagents, all other	14	147.000
Fludrocortisone acetate	06	656.000
Flunixin	06	401.280
Fluorelastomers (CFM, FKM, FFKM) type	10	11.000
9-Fluorenone	03	913.750
Fluorescent Breightener 290	04	780.290
Fluorescent Brightener 22	04	758.000
Fluorescent Brightener 28	04	761.000
Fluorescent Brightener 46	04	765.000
Fluorescent Brightener 49	04	766.000
Fluorescent Brightener 52	04	767.000
Fluorescent Brightener 61	04	770.000
Fluorescent Brightener 71	04	771.000
Fluorescent Brightener 102	04	773.000
Fluorescent Brightener 114	04	775.114
Fluorescent Brightener 128	04	778.000
Fluorescent Brightener 134	04	780.000
Fluorescent Brightener 191	04	780.191
Fluorescent Brightener 205	04	780.205
Fluorescent brighteners, all other	04	781.000
Fluorinated (Including other fluorohalogenated) hydrocarbons, all other	15	1276.000
Fluorocarbon resins,all other	08	38.200

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
Fluorometholone	06	657.000
Fluoxetine	06	527.400
Fluoxymesterone	06	640.000
Fluphenazine hydrochloride	06	485.000
Flutamide	06	692.700
Food, Drug, and Cosmetic Blue 1	04	782.000
Food, Drug, and Cosmetic Blue 2	04	783.000
Food, Drug, and Cosmetic Green 3	04	784.000
Food, Drug, and Cosmetic Red 3	04	786.000
Food, Drug, and Cosmetic Red 4	04	787.000
Food, Drug, and Cosmetic Red 40	04	787.040
Food, Drug, and Cosmetic Yellow 5	04	789.005
Food, Drug, and Cosmetic Yellow 6	04	790.000
Formaldehyde (37% HCHO by Weight)	15	791.000
Formaldehyde, dicyandiamide, ethylene sulfate polymers	12	780.500
Formaldehyde polymer with carbamate esters	14	487.000
Formaldehyde polymer with ethylenediamine and nonyl phenol derivatives	14	163.000
1-Formylpiperidine	03	919.153
Fuel additives, acyclic, all other	14	177.000
Fumaric acid	15	525.000
Fumaric acid, lead salt	15	657.000
2-Furaldehyde (Furfural)	15	82.000
Furan	03	920.000
Furan derivatives, all other	15	84.000
Furfuryl alcohol	03	921.000
Furfuryl alcohol, ethoxylated	12	744.600
Furfurylamine	03	921.102
Furfuryl type resins	08	7.000
Furoic acid	15	82.400
Furosemide	06	739.450
1-(2-Furoyl)piperazine	03	920.200
D-Galactose	14	456.000
Galaxolide (1,3,4,6,7,8-Hexahydro-4,6,6,7,8,8 -hexamethyl-cyclopenta- γ-2-benzopyran)	07	96.000
Gasoline additives, acyclic, all other	14	189.000
Gasoline additives, cyclic, all other	14	190.000
Gemfibrozil	06	620.500
Gentamycin	06	48.000
Geranyl acetate	07	151.000
Geranyl benzoate	07	40.200
Geranyl butyrate	07	153.000
Geranyl crotonate	07	153.001
Geranyl ethyl ether	07	153.007
Geranyl formate	07	153.010
Geranyl isobutyrate	07	153.020
Geranyl isovalerate	07	153.400
Geranyl nitrile (Citralva)	07	153.560
Geranyl propionate	07	153.600
Geranyl tiglate	07	153.800
Gibberellic acid	13	168.450
Glipizide	06	688.000
Glucoamylase	14	96.000
Glucoheptonic acid, β-isomer, sodium salt	14	65.000
Glucoheptonic acid, sodium salt	14	66.000
α-Gluconamidopropyl dimethy-2-hydroxyethyl ammonium chloride	12	471.500
Gluconic acid, potassium and sodium salts W/20% mix of sodium bisulfite-formaldehyde	12	57.530
Gluconic acid and salts, mixed	15	1434.800
Gluconic acid, technical	15	526.000
Glucose oxidase	14	123.000
Glucose-6-phosphate dehydrogenase	14	124.000
Glutamic acid hydrochloride	14	8.000
Glutamyl-p-nitroaniline (liver function test)	06	576.500
Glutaraldehyde	15	792.000
Glutaraldehyde bis(sodium bisulfite)	15	1333.000
Glutaric acid	15	526.900
glutaric acid esters, all other	11	85.950
Glutethimide	06	471.000
Glycerides, C_{14-18} and C_{16-18} mono- and di-	15	1110.400
Glycerides, mono, mixed	15	1110.430
Glycerine, alkoxylated	12	761.700
Glycerine, ethoxylated	12	761.710
Glycerine, ethoxylated and propoxylated	12	761.720
Glycerol, alkoxylated, toluene diisocyanate copolymer	12	761.800
Glycerol diacetyltartrate mono-oleate	12	643.000
Glycerol diacetyltartrate monostearate	12	644.000
Glycerol diester of coconut oil acids	12	659.960
Glycerol dilaurate	12	651.500
Glycerol esters of chemically defined acids, all other	12	659.000
Glycerol esters of mixed acids, all other	12	668.000
Glycerol, ethoxylated	12	729.700
Glycerol, ethoxylated and phosphated	12	111.900
Glycerol kinase	14	125.000
Glycerol mono- and diesters of mixed fatty acids	12	648.800
Glycerol mono-, di-, and triesters of hydrogenated tallow acids	12	667.000
Glycerol monoester of C_8-C_{10} acids	12	660.900
Glycerol monoester of coconut oil acids	12	661.000
Glycerol monoester of coconut oil acids, sulfated, sodium salt	12	267.000
Glycerol monoester of cottonseed oil acids	12	662.000
Glycerol monoester of hydrogenated cottonseed oil acids	12	663.000
Glycerol monoester of hydrogenated lard acids	12	663.500
Glycerol monoester of hydrogenated soybean oil acids	12	664.000
Glycerol monoester of lard acids	12	665.000
Glycerol monoester of mixed fatty acids, acetylated	12	649.000
Glycerol monoester of mixed fatty acids, phosphated	12	112.000
Glycerol monoester of mixed fatty acids, succinylated	12	649.100
Glycerol monoester of palm oil acids	12	665.800
Glycerol monoester of safflower oil acids	12	666.200
Glycerol monoester of tall oil acids	12	666.300
Glycerol monoester of tallow acids	12	666.400
Glycerol monolaurate	12	655.000
Glycerol mono-oleate	12	656.000
Glycerol mono-oleate, ethoxylated	12	650.100
Glycerol monoricinoleate	12	657.000
Glycerol monostearate	12	658.000
Glycerol monostearate sulfoacetate, sodium salt	12	200.000

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
Glycerol propoxylate triacrylate	15	1110.600
Glycerol sesquiester of hydrogenated tallow acids	12	667.400
Glycerol, synthetic only	15	1084.000
Glycerol triester of mixed fatty acids	12	667.900
Glycerol trioctanoate/decanoate	12	658.400
Glyceryl p-aminobenzoate	15	86.000
Glyceryl diacetate (Diacetin)	15	1111.000
Glyceryl monoacetate (Monoacetin)	15	1112.000
Glyceryl monoricinoleate	11	108.000
Glyceryl monothioglycolate	15	1113.000
Glyceryl triacetate (Triacetin)	15	1114.000
Glyceryl tri(acetylricinoleate)	11	109.000
Glyceryl triacetyl stearate	11	120.000
Glyceryl tribenzoate	11	5.500
Glyceryl trioleate (Triolein)	11	91.000
Glyceryl tripropionate	11	83.000
Glyceryl tristearate	15	1115.500
Glycidol (2,3-Epoxy-1-propanol)	15	1317.000
α-Glycidoxypropyltrimethoxysilane	15	1387.000
Glycidyl ethers, all other	15	1317.900
Glycine (Aminoacetic acid), non-medical	14	10.000
Glycolic acid (Hydroxyacetic acid)	15	528.000
Glycolic acid, potassium salt	15	663.750
Glycolic acid, sodium salt	15	664.000
Glycol pelargonate	11	84.000
Glycol residues	15	1435.000
Glycopyrrolate	06	288.500
Glyoxal	15	793.000
Glyoxal-formaldehyde resins	08	7.500
Gold sodium thiomalate	06	401.300
Gonadorelin, acetate	06	692.900
Grease, other than wool, sulfated, sodium salt	12	292.000
Guaiacwood acetate	07	96.100
Guaiene	07	96.200
Guaifenesin	06	584.000
Guanidine hydrochloride	15	396.000
Halcinonide	06	659.500
Half-phthalic acid ester of tallow alkanolamide/monoglyceride	12	318.300
Haloperidol	06	500.800
Heliotropyl acetate	07	80.500
Heliotropyl acetone	07	80.520
Heptachloro-tetrahydro-endo-methanoindene (Heptachlor)	13	136.000
2-Heptadecyl-1,4-hydroxymethyl-4-ethyl-2-oxazoline	12	345.950
2-Heptadecyl-2-imidazoline	12	410.000
Heptadecylmethylbenzimidazolinesulfonic acid, sodium salt	12	26.000
Heptaldehyde-aniline condensate	09	6.000
n-Heptane	02	71.000
Heptanoic acid	15	528.500
Heptanoic acid, potassium salt	12	57.550
Heptanolide	07	154.600
2-Heptanone (Methyl amyl ketone)	15	819.000
Heptenes, mixed	02	72.000
n-Heptyl alcohol	15	856.000
2-Heptylcyclopentanone	07	96.500
Herring oil, sulfated	12	298.490
Herring oil, sulfated, sodium salt	12	299.000
Hetacillin, potassium	06	15.200
Hexabromocyclodecane	15	87.800
Hexachlorocyclopentadiene	03	924.000
1,4,5,6,7,7-Hexachloro-5-norbornene-2,3-dicarboxylic anhydride (Chlorendic anhydride)	03	925.100
Hexadecane	15	1342.000
1-Hexadecanol (Cetyl alcohol)	15	873.000
Hexadecanolide	07	96.600
Hexadecyl alcohol, ethoxylated	12	730.000
Hexadecyl alcohol, propoxylated	12	730.015
Hexadecylamine	12	421.000
Hexadecyldiphosphate	12	99.500
Hexadecylmonophosphate	12	99.520
N-Hexadecylmorpholine	12	347.000
Hexadecyl stearate	11	121.310
Hexadecyl sulfate, sodium salt	12	230.000
Hexadecylsulfonyl chloride	15	1335.020
Hexadecyltrimethylammonium bromide	12	494.000
Hexadecyltrimethylammonium chloride	12	495.000
Hexafluoropropylene, monomer	15	1267.000
Hexaglycerol	12	691.947
Hexahydro-5-methoxy-4,7-methano-1H-indene	07	40.300
Hexahydro-1,3,5-triethyl-s-triazine	13	40.012
Hexahydro-1,3,5-tri(2-hydroxyethyl)-s-triazine	13	40.022
Hexamethyldisilazane	15	1387.500
Hexamethylenediamine adipate (Nylon salt)	15	397.000
Hexamethylenediaminetetra(methylenephosphonic acid), potassium salt	14	68.000
Hexamethylene-1,6-diisocyanate (HD1)	15	397.100
Hexamethylene-α,6-diisocyanate,biurets (HD1-biurets)	15	397.150
Hexamethylene-1,6-diisocyanate trimers (HD1 trimers)	15	397.200
Hexamethyleneimine	03	927.870
Hexamethylenetetramine, tech	15	88.000
N-hexanal	07	155.310
Hexane	02	65.000
1,6-Hexanediamine (Hexamethylenediamine)	15	283.000
1,6-Hexanediol	15	1085.000
1,6-Hexanediol diacrylate	15	1117.000
2-Hexenal	07	155.300
1-Hexene	02	67.015
Hexenes, mixed	02	67.020
2-Hexenol	07	155.400
cis-3-Hexen-1-yl acetate	07	155.650
cis-3-Hexenyl butyrate	07	155.653
cis-3-Hexenyl methyl carbonate	07	155.654
cis-3-Hexenyl salicylate	07	40.500
cis-3-Hexenyl tiglate	07	155.656
Hexoxyacetaldehyde dimethyl acetal	07	155.700
Hexyl acetate	15	984.000
Hexyl acetate	07	155.705
n-Hexyl alcohol	15	857.000

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
n-Hexylamine	15	284.000
Hexylamine ethoxylate	15	398.000
Hexyl caproate	07	155.710
Hexyl (Isonanoyl anide) carboxylic acid, mono, triethanolamine salts	12	57.560
α-Hexylcinnamaldehyde	07	41.000
Hexyl n-decyl phthalate	11	44.000
Hexyl(isonanoyl anide)carboxylic acid, triethanol-, diethanolamine, mixed salts	12	57.565
Hexyl 2-methylbutyrate	07	155.715
Hexyl nitrate	14	149.000
2-[2-(Hexyloxy)ethoxy]ethanol	15	1164.000
Hexyloxypropanesulfonic acid, sodium salt	12	207.000
Hexyloxypropyl amine	12	328.600
Hexyl phosphate	12	99.900
Hexyl phosphate, potassium salt	12	99.910
Homomenthyl salicylate	15	89.000
Humatrope	06	693.500
Hydralazine hydrochloride	06	357.000
Hydratropaldehyde	07	42.000
Hydratropaldehyde,dimethyl acetal	07	43.000
Hydrazine acetate	15	594.500
Hydrindantin	15	91.000
Hydrocarbon carboxylic acid derivatives (specify)	14	205.000
Hydrocarbon derivativesall other hydrocarbon derivatives	02	97.000
Hydrocarbon phosphorous acid, barium salt	14	206.000
Hydrocarbon phosphoryl derivatives	14	207.000
Hydrocarbons, all other	15	1349.000
Hydrocarbons, C_4, all other	02	52.000
Hydrocarbons, C_5, all other	02	59.000
Hydrocarbons, C_6, all other	02	68.000
Hydrocarbons, C_7, all other	02	73.000
Hydrocarbons, C_8, all other	02	77.000
Hydrocarbons, C_9 and above, all other, including mixtures	02	89.000
Hydrocarbons, C_4 fraction	02	51.200
Hydrocarbons, C_2-C_3 mixtures	02	43.000
Hydrocarbons, C_4 mixtures	02	49.600
Hydrocarbons, C_5 mixtures	02	58.500
Hydrocarbons, C_5-C_6 mixtures	02	67.030
Hydrocarbons, C_5-C_7 mixtures	02	67.040
Hydrocarbons, C_6-C_7 mixtures	02	72.500
Hydrochlorothiazide	06	722.000
Hydrocinnamic acid	07	43.500
Hydrocodone bitartrate	06	433.000
Hydrocortisone	06	660.000
Hydrocortisone acetate	06	661.000
Hydrocoumarin	07	44.000
Hydrogenated castor oil, ethoxylated	12	670.000
Hydrogenated menhaden fish oil	15	1329.050
Hydrogenated tallow acids, aminoethylethanolamide, acetate salt	12	575.280
(Hydrogenated tallow alkyl)amine	12	422.000
(Hydrogenated tallow alkyl)amine acetate	12	394.000
(Hydrogenated tallow alkyl)amine, ethoxylated	12	329.000
(Hydrogenated tallow alkyl)trimethylammonium chloride	12	498.000
Hydrogenated tallow amides, ethoxylated	12	575.200
1-(2-Hydrogenated tallow amidoethyl)-2-nor (hydrogenated tallow)-2-imidazoline	12	386.500
Hydrogenated tallow glycerides	15	1329.000
Hydrogenated tallow glycerides diethylenediamine condensate	12	587.943
Hydrolytic enzyme mixtures	14	113.000
Hydromorphone hydrochloride	06	401.400
Hydroquinone (Hydroquinol)	14	357.000
Hydroquinone, di(β-hydroxyethyl) ether	15	91.250
Hydroquinone, tech	03	934.000
p-Hydroxybenzaldehyde	03	943.000
p-Hydroxybenzenesulfonic acid	03	944.000
p-Hydroxybenzoic acid	03	946.000
p-Hydroxybenzoic acid, butyl ester	15	92.000
p-Hydroxybenzoic acid, ethyl ester	15	93.000
p-Hydroxybenzoic acid, methyl ester	15	94.000
p-Hydroxybenzoic acid, propyl ester	15	95.000
4-Hydroxy-2H-1,2-benzothiazine-3-carboxylic acid, methyl ester, 1,1-dioxide	03	947.000
4-Hydroxybenzylbenzene	03	948.000
Hydroxychloroquine sulfate	06	175.000
Hydroxycitronellal methyl anthranilate	07	44.050
Hydroxycitronellol	07	156.500
2'-Hydroxy-5,9-dimethyl-6,7-benzomorphan	03	953.550
7-Hydroxy-3,7-dimethyl-1-octanal (Hydroxycitronellal)	07	156.000
7-Hydroxy-3,7-dimethyl octanal, dimethyl acetal (Hydroxycitronellal, dimethyl acetal)	07	157.000
Hydroxyethane-1-diphosphonic acid	14	69.000
4-Hydroxy-3-ethoxybenzaldehyde (Ethylvanillin)	07	44.100
Hydroxyethyl acrylate	15	1119.000
2,2' [[-4-(2-Hydroxyethylamino)-3-nitrophenyl imino diethanol	03	955.700
3-[N-(2-Hydroxyethyl)anilino]propionitrile	03	956.000
Hydroxyethylcellulose	14	409.000
N-β-Hydroxyethyl-2,4-dihydroxybenzamide	03	958.000
(2-Hydroxyethyl)dimethyl(3-stearamidopropyl) ammonium dihydrogen phosphate	12	472.000
(2-Hydroxyethyl)dimethyl(3-stearamidopropyl) ammonium nitrate	12	474.000
N-(2-Hydroxyethyl)-1,2-diphenylethylenediamine	12	351.000
(N-Hydroxyethylethylenedinitrilo)triacetic acid, iron salt	14	72.000
(N-Hydroxyethylethylenedinitrilo)triacetic acid, magnesium salt	14	73.000
(N-Hydroxyethylethylenedinitrilo)triacetic acid, trisodium salt	14	74.000
1-Hydroxyethyl-1-(2-hydroxy-3-sodiumsulfonatopropyl)-2-capryl-2-imidazolinium hydroxide	12	26.600
1-Hydroxyethyl-1-(2-hydroxy-3-sodiumsulfonatopropyl)-2-nor-coconut oil fatty acids-2-imidazolinium hydroxide	12	26.700
1-Hydroxyethyl-1-(2-hydroxy-3-sodiumsulfonatopropyl -2-oleyl-2-imidazolinium hydroxide	12	26.800
N-(2-Hydroxyethyl)-12-hydroxystearamide	15	399.200

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
Hydroxyethylidene diphosphonic acid, potassium salt	14	75.000
Hydroxyethylidene diphosphonic acid, sodium salt	14	76.000
Hydroxyethyl methacrylate	15	1119.200
1-(2-Hydroxyethyl)-2-nonyl-2-imidazoline	12	348.000
1-(2-Hydroxyethyl)-2-nor(coconut oil alkyl)-2- imidazoline	12	349.000
1-(2-Hydroxyethyl)-2-nor(soya oil alkyl)-2-imidazoline	12	351.600
1-(2-Hydroxyethyl)-2-nor(tall oil alkyl)-2-imidazoline	12	350.000
2-Hydroxyethyl n-octyl sulfide	13	233.010
N-(Hydroxyethyl)piperazine	15	96.000
3-Hydroxy-2-ethyl-4-pyrone (Ethylmaltol)	07	97.000
1-(2-Hydroxyethyl)-1-(sodium carboxymethyleneoxyethylene)-2-nor-coconut oil fatty acids-2-imidazolinium hydroxide	12	26.900
1-(2-Hydroxyethyl)-2-(tall oil alkyl)imidazoline, fatty acid salt	12	351.700
N-(2-Hydroxyethyl)-N,N',N'-tris(2-hydroxypropyl) - ethylenediamine	12	330.000
Hydroxyethyl-2-undecyl-2,3-imidazoline	12	464.000
2-Hydroxy, 3-(lauryl-myristyl)(oxy-1 propane sulfonic acid), sodium salt	12	207.050
4-Hydroxy-3-methoxybenzaldehyde [Vanillin]	07	44.300
2-Hydroxy-4-methoxybenzophenone	15	97.000
2,Hydroxy-4-methoxybenzophenone-5-sulfonic acid	15*	97.010
4(4-Hydroxy-3-methoxyphenyl)-2-butanone (Vanillyacetone)	07	44.800
2-(Hydroxymethyl)amino-2-methylpropanol	13	245.014
4-Hydroxy-2-methyl-2H-1,2-benzothiazine -3-carboxylic acid, methyl ester, 1,1-dioxide	03	969.050
2-Hydroxymethylene-17α-ethinylandrost -17β-ol-4-en-3-one	03	969.010
2-[(Hydroxymethyl)ethanol	13	245.012
N-(Hydroxymethyl)-formamide	15	244.950
Hydroxymethyl-5,5-hydantoin	15	99.500
Hydroxymethyl(methyl)dithiocarbamic acid, potassium salt	13	185.500
4-Hydroxymethyl-4-methyl-1-phenyl-3-pyrazolidone	14	360.000
2-(Hydroxymethyl)-2-methyl-1,3-propanediol (Trimethylolethane)	15	1086.000
2-(Hydroxymethyl)-2-nitro-1,3-propanediol (Tris-(hydroxymethyl)nitromethane)	15	401.000
4-Hydroxy-4-methyl-2-pentanone (Diacetone alcohol)	15	823.000
4-(4-Hydroxy-4-methyl pentyl)-3-cyclohexene -10-carboxaldehyde (Lyral)	07	97.200
3-Hydroxy-2-methyl-4-pyrone (Maltol)	07	98.000
3-Hydroxy-N-(3-N-morpholino-γ-propyl) -2-naphthimide	03	972.500
6-Hydroxy-2-naphthalenesulfonic acid, sodium salt	03	987.000
1-Hydroxy-2-naphthoic acid	03	990.000
3-Hydroxy-2-naphthoic acid (B.O.N.)	03	992.000
3-Hydroxy-2-naphthoic acid, ethanolamide	03	992.302
1-Hydroxynaphthoic acid, methyl ester	03	990.500
3-Hydroxy-2-naphthoic acid, methyl ester	03	993.000
3-Hydroxy-2-naphthoic acid, sodium salt	03	994.802
4-Hydroxynonanic acid, γ-lactone (γ-Nonalactone)	07	99.000
1-Hydroxy-6-octadecyloxy-2-naphthoic acid	03	1000.302
2-Hydroxy-4-N-octoxybenzophenone	15	99.750
p-Hydroxy phenylbutanone	07	44.850
α-D-p-Hydroxyphenylglycine methyl ester K	15	100.200
Hydroxyprogesterone caproate	06	679.800
Hydroxy-2-propanone (Acetol)	07	157.100
Hydroxypropyl acrylate	15	1120.000
Hydroxypropyl ammonium cyano acetate	12	497.800
2-Hydroxypropyl cellulose	14	410.000
Hydroxypropyl guar gum	14	421.000
Hydroxypropyl methacrylate	15	1121.000
N-2-hydroxy propyl-n-methyl-N,n-bistallow amide ethyl ammonium ethyl sulfate	12	474.190
8-Hydroxy-5-quinolinesulfonic acid	06	261.000
4-Hydroxyundecanoic acid, γ-lactone (γ-Undecalactone)	07	101.000
Hydroxyzine hydrochloride	06	501.000
Hydroxyzine pamoate	06	502.000
Hygromycin B	06	66.000
Hypnotics and sedatives, other than barbiturates, all other	06	475.000
Ibuprofen	06	401.500
2-Imidazoline-1-(2-aminoethyl)-2-(tall oil alkyl), ethoxylated	12	330.050
Imidazoline from tall oil fatty acids and diethylenetriamine	14	164.000
Imidazolinium, 1-carboxymethyl)-4,5-dihydro-1 -(hydroxyethyl)-2-nor(cocoalkyl), hydroxides, monosodium salts	12	474.400
Imidazolinium, 1-(carboxymethyl)-2-heptyl-1- (2-hydroxyethyl), hydroxide, sodium salt	12	474.430
Iminodiacetic acid	15	403.000
Imipenem	06	62.100
Imipramine hydrochloride	06	528.000
5-Indanol	03	1012.500
1,2,3-Indantrione monohydrate (Ninhydrin)	15	103.000
Indomethacin	06	402.000
Insect attractants, all other	13	120.000
Insulin	06	694.000
Iodinated glycerol	06	586.000
Iodinated (not otherwise halogenated) hydrocarbons, all other	15	1281.000
Iodobutane	15	1277.900
Iodochlorhydroxyquin	06	176.000
Iodoethane (Ethyl iodide), non-medical	15	1278.000
Iodoform	06	262.000
Iodomethane (Methyl iodide)	15	1280.000
1-Iodoperfluorohexane	15	1268.000
3-Iodo-2-propynyl butylcarbamate	13	245.013
Iohexol	06	566.000
Ionone(α- and β-)	07	104.000
α-Ionone	07	102.000
β-Ionone	07	103.000
Iothalamate, meglumine	06	570.000
Iron acetylacetonate complex	15	1371.750
Iron t-α-alkylcarboxylate	15	670.000
Iron 2-ethylhexanoate	15	636.000
Iron naphthenate	14	303.000

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
Isatoic anhydride	03	1016.700
Isooctanoic acid, lead salt	15	672.700
Isooctanoic acid, manganese salt	15	672.800
Isoamyl caproate	07	157.400
Isoamyl caprylate	07	157.405
Isoamyl phenylacetate	07	45.300
Isoamyl propionate	07	157.700
Isoascorbic acid (Erythorbic acid)	15	533.000
Isoascorbic acid, sodium salt (Sodium erythorbate)	15	667.000
Isobornyl acetate	07	105.000
Isobornyl methyl ether	07	105.200
Isobornyl propionate	07	105.300
Isobutane (2-Methylpropane)	02	50.000
Isobutanol, ethoxylated and sulfated, ammonium salt	12	275.200
Isobutyl acetate	15	892.000
Isobutyl acetate	07	158.000
Isobutyl acrylate	15	987.000
Isobutyl alcohol (Isopropylcarbinol)	15	849.000
Isobutylaluminum chloride	15	1361.500
Isobutylbenzene	03	1016.750
Isobutyl biphenyl	15	103.800
Isobutyl-2-butenoate	07	158.003
Isobutyl butyrate	07	158.005
Isobutyl chloroformate	15	988.000
Isobutylene (2-Methylpropene)	02	51.000
Isobutyl isobutyrate	15	989.000
Isobutyl methacrylate	15	989.500
Isobutyl oleate	11	92.300
Isobutyl palmitate	11	97.000
Isobutyl phenylacetate	07	46.000
Isobutylquinoline	07	46.400
Isobutyl salicylate	07	47.000
Isobutyl stearate	11	121.390
Isobutyltrimethoxysilane	15	1387.600
Isobutyraldehyde	15	796.000
Isobutyric acid	15	534.000
Isobutyric anhydride	15	535.000
Isobutyronitrile	15	443.000
Isobutyrophenone	03	1016.800
Isocetyl stearate	15	971.800
Isodecyl acrylate	15	990.000
Isodecyl alcohol	15	857.500
Isodecyl alcohol, alkoxylated	12	730.150
Isodecyl alcohol, ethoxylated	12	760.900
Isodecyl alcohol, ethoxylated and propoxylated	12	760.910
Isodecyl diphenyl phosphate	11	12.500
Isodecyl mercaptoacetate	15	990.100
Isodecyl methacrylate	15	990.700
Isodecyloxypropylamine	12	330.100
Isodecyloxypropylamine, ethoxylated	12	330.103
3-(3-Isodecyloxy)propylaminopropyl amine	12	330.105
Isodecyloxypropyliminopropionic acid, monosodium salt	12	13.900
N-Isodecyloxypropyl trimethylene diamine	12	330.350
Isodecyl pelargonate	11	85.000
Isodecyl stearate	11	121.395
Isodicycloxypropyl amine propoxylated acetate	12	330.420

Chemical name	Sect. No.	Item No.
Isoflupredone, acetate	06	670.001
Isoflurane	06	439.001
Isoheptanes	02	69.000
Isoheptyl alcohol	15	857.700
iso-Hexadecenyl succinic anhydride	15	165.720
Isohexane	02	66.000
Isohexenyl tetrahydrobenzaldehyde (Myrac aldehyde)	07	47.200
Isojasmone	07	105.500
Isolongifolene epoxide	07	105.800
Isomenthone	07	106.000
Isonanoic acid, mono- and triethanolamine salt	12	564.150
Isonanoic acid, sodium salt	12	57.570
Isonanylamidocaproic acid, triethanolamine salt	12	27.000
Isonicotinic acid	03	1027.900
Isonicotinonitrile	03	1029.000
Isononanoyl chloride	15	536.730
Isononyl alcohol	15	858.000
Iso-octadecenoic acid	15	536.800
Iso-octadecenylsuccinic anhydride	15	165.750
Iso-octadecyl alcohol	15	858.800
Isooctanoic acid, calcium salt	15	672.600
Iso-octyl alcohol	15	859.000
Iso-octyl alcohol, ethoxylated	12	761.000
Iso-octyl hydrogen phosphate	15	1033.000
Iso-octyl mercaptoacetate	15	991.000
Iso-octyl-3-mercaptopropionate	15	992.000
Iso-octyl oleate	11	92.600
Iso-octylphenol, ethoxylated	12	745.000
Isooctylphenol, ethoxylated, benzyl ether	12	745.020
Isooctyl phosphate	12	100.400
Isooctyl phosphate, potassium salt	12	100.420
Iso-octyphenol, ethoxylated and sulfonated, sodium salt	12	207.100
Isopentane (2-Methylbutane)	02	53.000
Isopentyl acetate (Isoamyl acetate)	07	158.950
Isopentyl benzoate	07	47.700
Isopentyl butyrate	07	159.000
Isopentyl formate	07	160.000
Isopentyl isovalerate	07	161.000
Isopentyl salicylate	07	48.000
Isophthalic acid (Benzene-1,3-dicarboxylic acid)	03	1031.000
Isophthalic acid, dimethyl ester	03	1032.000
Isophthalonitrile	03	1034.000
Isophthaloyl chloride	03	1034.100
Isoprene (2-Methyl-1,3-butadiene)	02	54.000
Isopropamide iodide	06	290.000
Isopropanolamine condensates, all other	12	574.000
Isopropenylaluminum	15	1362.000
Isopropoxy-tris(2-ethylenediamino)ethyl titanate	12	330.270
Isopropyl acetate	15	993.000
Isopropyl alcohol	15	860.000
Isopropylamine, mono	15	287.000
2-Isopropylaminoethanol	15	411.000
Isopropylbiphenyl	03	1035.118
Isopropyl chloroformate	15	994.000
Isopropyl N-(3-chlorophenyl)carbamate (CIPC)	13	74.000
2-Isopropylcyclohexanol	07	106.200

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
6-Isopropyldecalone	07	106.210
Isopropyl ether	15	1319.000
5,5'-Isopropylidenebis(2-hydroxy-m-xylene-α, α'-diol)	03	1037.000
4,4'-Isopropylidenediphenol (Bisphenol A)	03	1038.000
4,4'-Isopropylidenediphenol, ethoxylated	03	1039.000
4,4'-Isopropylidenediphenol, propoxylated	03	1040.000
Isopropyl iodide	15	1280.500
Isopropyl linoleate	15	972.000
Isopropyl mercaptan (2-Propanethiol)	02	96.030
Isopropyl-11-methoxy-3,7,11-trimethyldodeca -2,4-dienoate	13	231.014
Isopropyl myristate	11	88.000
Isopropylnaphthalenesulfonic acid	12	170.000
Isopropyl oleate, sulfated, sodium salt	12	260.000
Isopropyl palmitate	11	98.000
o-Isopropylphenol	03	1041.000
Isopropylphenol, mixed	03	1041.100
N-Isopropyl-N'-phenyl-p-phenylenediamine	09	63.000
Isopulegyl acetate	07	106.220
Isostearamidopropyl dimethylamino glycolate	12	474.500
Isostearic acid, aminoethylethanolamide, acetate salt	12	575.340
Isostearic acid, isoproxy titanium salt	12	57.600
Isostearic acid, mixed isopropanolamines salt	12	29.490
Isostearic acid, triethanolamine salt	12	29.500
Isostearic amphopropionate	12	13.100
Isostearyl alcohol, ethoxylated	12	730.200
Isostearyl isostearate	15	972.300
Isostearyl neopentanoate	15	995.000
Isotridecyloxypropylamine	12	330.300
N-Isotridecyloxypropyl trimethylene diamine	12	330.320
Isovalerone (Diisobutyl ketone)	15	824.000
2-Isovaleryl-1,3-indandione	13	169.900
Itaconic acid (Methylenesuccinic acid)	15	539.000
Ivermectin	06	133.001
Kanamycin	06	50.000
Ketamine hydrochloride	06	437.000
Ketimine, tetrafunctional	15	414.000
Ketones, all other	15	839.000
Lactic acid, edible, 100%	15	541.000
Lactic acid, technical, 100%	15	542.000
Lanolin acid	15	104.763
Lanolin alcohol acetate	15	104.770
Lanolin, ethoxylated	12	671.000
Lanolin, hydroxylated	15	104.773
Lanolin oil	15	104.785
Lanolin wax	15	104.793
Laradine	06	96.500
Lard oil acids	12	533.650
Lard, sulfated, sodium salt	12	293.000
Lasalocid, sodium	06	66.600
Latex type polyvinylidene chloride resins	08	50.010
Lauraldehyde	07	162.000
3-Lauramido-N,N-dimethylpropylamine oxide	12	387.000
(3-Lauramidopropyl)trimethylammonium methyl sulfate	12	475.000
Lauric acid	12	570.000
Lauric acid (Ratio = 1/1)	12	547.000
Lauric acid (Ratio = 1/1)	12	564.300
Lauric acid (Ratio = 2/1)	12	534.000
Lauric acid esters, all other	11	87.000
Lauric acid, potassium salt	12	58.000
Lauric acid, zinc salt	15	678.000
Lauric and myristic acid (Ratio = 1/1)	12	547.200
Lauric and myristic acids (Ratio = 2/1)	12	535.000
Lauric and myristic acids (Ratio = 1/1)	12	564.400
Lauroyl chloride	15	543.000
Lauroyl peroxide	15	1296.400
N-Lauroylsarcosine, sodium salt	12	44.000
Lauryl alkyl dimethylamine acetate	14	489.250
Lauryl alkyl dimethylamine phosphate	14	489.260
Laurylamidopropyl betaine	12	13.400
Laurylamphoglycinate	12	13.500
Lauryl lactate	15	996.000
Lauryl methacrylate	15	997.000
Lauryl methacrylate-stearyl methacrylate copolymer resins	08	19.980
Lauryl pyridinium chloride	12	498.500
Lead acetate	15	595.000
Lead t-α-alkylcarboxylate	15	670.500
Lead-cobalt neodecanoate	15	706.000
Lead 2-ethylhexanoate	15	637.000
Lead naphthenate	14	306.000
Lead neodecanoate	15	707.000
Lead stearate	15	756.000
Lead stearate, dibasic	15	757.000
Lead subacetate	15	596.000
Lead tallate	15	176.000
Leuco Sulfur Black 1	04	1107.000
Leuco Sulfur Black 2	04	1110.000
Leuco Sulfur Black 18	04	1115.018
Leuco Sulfur Blue 7	04	1075.000
Leuco Sulfur Blue 11	04	1080.000
Leuco Sulfur Blue 13	04	1081.000
Leuco Sulfur Brown 1, 1:1	04	1089.000
Leuco Sulfur Brown 3	04	1091.000
Leuco Sulfur Brown 10	04	1093.000
Leuco Sulfur Brown 37	04	1101.000
Leuco Sulfur Brown 52	04	1101.052
Leuco Sulfur Green 3	04	1085.000
Leuco Sulfur Green 16	04	1087.000
Leuco Sulfur Green 34	04	1087.034
Leuco Sulfur Green 35	04	1087.035
Leuco Sulfur Green 36	04	1087.036
Leuco Sulfur Red 14	04	1070.014
Leuco Sulfur Yellow 22	04	1064.022
Leuprolide acetate	06	278.600
Levodopa	06	835.000
Lidocaine	06	706.000
Lidocaine hydrochloride	06	706.100
Light-oil distillates, all other	01	9.000
Lignin amine	12	357.010

Table D-1—Continued
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Chemical name	Sect. No.	Item No.
Lignin, ethoxylated	12	761.900
Lignin, sodium salt	12	318.400
Ligninsulfates, all other	12	159.000
Ligninsulfonic acid, ammonium salt	12	153.000
Ligninsulfonic acid, calcium salt	12	154.000
Ligninsulfonic acid, chromium salt	12	155.000
Ligninsulfonic acid, iron salt	12	156.000
Ligninsulfonic acid, magnesium salt	12	157.000
Ligninsulfonic acid, mixed chromium and iron salts	12	157.200
Ligninsulfonic acid, potassium salt	12	157.700
Ligninsulfonic acid, sodium salt	12	158.000
Ligninsulfonic acid, zinc salt	12	158.500
l-Limonene	07	50.200
Linalyl anthranilate	07	49.500
Linalyl benzoate	07	49.600
Lincomycin (animal feed grade)	06	67.000
Lincomycin (medicinal grade)	06	51.000
Linear alcohols, sulfated, all other	12	240.000
Linear saturated polyester	14	387.000
Linoleic acid (Ratio = 1/1)	12	547.800
Linoleic acid (Ratio = 2/1)	12	536.000
Linoleic acid dimers, alkoxylated	12	711.200
Lipase	14	114.000
Lisinopril	06	357.300
Lithium heparin	06	627.000
Lithium hydroxystearate	15	1373.500
Lithium naphthenate	14	307.000
Lithium neodecanoate	15	708.000
Lithium stearate	15	758.000
Lovastatin	06	379.000
Loxapine succinate	06	503.700
Lubricating oil and grease additives, acyclic, all other	14	293.000
Lubricating oil and grease additives, cyclic, all other	14	294.000
2,6-Lutidine	03	1047.000
Mafenide	06	202.900
Mafenide acetate	06	203.000
Magnesium acetate	15	598.000
Magnesium gluconate	06	764.000
Magnesium methylate	15	1352.000
Magnesium salicylate	06	262.500
Magnesium stearate	15	759.000
Maleic acid, monoalkyl ester	12	44.500
Maleic anhydride	15	104.800
Maleic anhydride, polypropylene glycol copolymer	12	711.700
Malic acid	15	547.000
Malonanilide	03	1048.930
Maltase	14	97.000
D-Maltose	14	459.000
Manganese acetate	15	599.000
Manganese t-α-alkylcarboxylate	15	671.000
Manganese 2-ethylhexanoate	15	639.000
Manganese gluconate	06	765.000
Manganese naphthenate	14	309.000
Manganese neodecanoate	15	709.000
Manganese tallate	15	177.000
Mannitol	15	1087.000
1,2-Maphthoquinone-2-diazide-5-sulfonyl chloride (215-sultonyl chloride)	15	122.300
Maprotiline hydrochloride	06	529.000
Meclizine hydrochloride	06	81.000
Meclofenamate, sodium	06	402.500
Meclofenamic acid	06	402.600
Medicinal chemicals, all other	06	837.000
Medroxyprogesterone acetate	06	680.000
Medrysone	06	662.000
Mefenamic acid	06	403.000
Megestrol acetate	06	680.500
Melamine	03	1050.000
Melamine formaldehyde methanol polymer	14	483.000
Melamine-formaldehyde resins	08	8.000
Melamine formaloehyde copolymer	14	489.500
Melamine stearyl alcohol polymer	14	490.000
Melengestrol acetate	06	681.000
p-Mentha-1,3-diene (α-Terpinene)	07	107.600
p-Mentha-1,4-diene (γ-Terpinene)	07	107.700
p-Mentha-1,8-diene (Limonene)	07	50.000
dl-p-Mentha-1,8-diene (Limonene)	03	1052.000
p-Mentha-6,8-dien-z-ol (Carveol)	07	106.800
p-Mentha-6,8-dien-z-one (Carvone, Carvol)	07	107.000
1-p-Mentha-6,8-dien-2-yl acetate (Carvyl acetate)	07	107.100
p-Menth-8-en-3-ol (Isopulegol)	07	108.300
p-Menth-1-en-3-one (Piperitone)	07	108.400
p-Menth-4-(8)-en-3-one (Pulegone)	07	108.700
1-1-p-Menthen-6-yl-1-propanone	07	108.600
dl-Menthol, synthetic	07	110.100
l-Menthol, synthetic	07	110.200
Menthyl acetate	07	111.000
l-Menthyl acetate	07	111.100
Menthyl anthranilate	07	50.500
Meperidine hydrochloride	06	404.000
Mercaptoacetic acid (Thioglycolic acid)	15	549.000
Mercaptoacetic acid (Thioglycolic acid) salts, all other	15	698.000
2-Mercaptobenzothiazole	09	30.000
2-Mercaptobenzothiazole, copper salt	09	30.300
2-Mercaptobenzothiazole, sodium salt	13	40.024
2-Mercaptobenzothiazole, zinc salt	09	32.000
2-Mercaptoethanol	15	1353.000
N-(Mercaptomethyl)phthalimide S-(O,O-dimethylphosphorodithioate)	13	165.024
3-Mercapto-1,2-propanediol (Thioglycerol)	15	1088.000
3-Mercaptopropionic acid	15	550.000
Mercaptopropyltrimethoxysilane	15	1388.000
Mercaptosuccinic acid (Thiomalic acid)	15	551.000
2-Mercaptotololuimidazole, zinc salt	09	41.475
Merox disulfide	15	1353.500
Meta, para-cresol, ethoxylated and polyphosphated, neutralized	12	81.900
Methacrylamide	15	247.000
Methacrylate based cationic polyelectrolytes	15	1450.600

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
Methacrylic acid	15	552.000
α-Methacryloxypropyltrimethoxysilane	15	1389.000
Methadone hydrochloride	06	405.000
Methamphetamine hydrochloride	06	520.000
Methane	02	37.000
Methanearsonic acid, disodium salt (DSMA)	13	204.000
Methanearsonic acid, dodecyl- and octyl- ammonium salts	13	205.000
Methanearsonic acid, monosodium salt (MSMA)	13	205.900
Methanesulfonic acid	15	553.000
Methanesulfonyl chloride	15	554.000
Methanol, ethoxylated and propoxylated	12	730.725
Methanol, synthetic only	15	861.000
Methenamine	06	239.000
Methenamine hippurate	06	240.000
Methenamine mandelate	06	241.000
Methimazole	06	645.000
Methionine (animal feed grade)	14	13.000
Methionine, hydroxy analogue, calcium salt	14	15.000
Methocarbamol	06	479.000
Methotrexate	06	279.300
o-Methoxy benzaldehyde	07	51.950
p-Methoxybenzyl alcohol (Anisyl alcohol)	07	52.000
2-Methoxyethanol (Ethylene glycol monomethyl ether)	15	1168.000
2-(2-Methoxyethoxy)ethanol (Diethylene glycol monomethyl ether)	15	1169.000
2-[2-(2-Methoxyethoxy)ethoxy]ethanol (Triethylene glycol monomethyl ether)	15	1170.000
2-(2-Methoxyethoxy)ethyl-2-methoxyethyl ether (Triethylene glycol dimethyl ether)	15	1171.000
1-Methoxy-2-ethyl acetate	15	1000.800
2-Methoxyethyl acetate	15	1124.000
2-Methoxyethyl acrylate	15	1001.000
Methoxyethyl morpholine	15	108.450
2-Methoxynaphthalene	07	53.000
N-(2-Methoxy-1-naphthyl)acetamide	03	1060.000
Methoxyphenamine hydrochloride	06	335.000
4-Methoxyphenol	15	109.000
(p-Methoxyphenyl)acetic acid	03	1063.000
1-p-Methoxyphenyl penten-1-one-3 (α-Methyl-anisalacetone)	07	53.400
3-(2-Methoxyphenyl)-2-propenal	07	76.700
Methoxypolyethylene glycol	15	1172.000
1-Methoxy-2-propanol	15	1173.000
2-Methoxy-4-propenylphenol (Isoeugenol)	07	54.000
2-Methoxy-4-propenylphenol, acetate	07	54.100
3-Methoxypropionitrile	15	448.200
Methoxypropyl acetate	15	1173.200
3-Methoxypropylamine	15	417.000
2-Methoxy-4-propylphenol	07	54.150
p-Methoxytoluene	15	109.300
Methscopolamine bromide	06	620.700
Methsuximide	06	421.000
Methyl acetoacetate	15	1003.000
4'-Methylacetophenone	07	55.000
Methyl acrylate, monomer	15	1004.000
Methylal (Dimethoxymethane)	15	1320.000
Methyl alcohol, alkoxylated	12	730.700
Methylamine, mono-	15	290.000
2-Methylaminoethanol (N-Methylethanolamine)	15	419.000
p-Methylaminophenol sulfate (Metol)	14	362.000
Methyl (tri-hydrogenated tallow alkyl) ammonium chloride	12	498.900
Methyl amyl alcohol	15	862.999
Methyl-t-amyl ether	14	183.000
2-(N-Methylanilino)ethanol	03	1070.000
3-(N-Methylanilino)propionitrile	03	1071.000
p-Methylanisole	07	56.000
Methyl anthranilate	07	57.000
2-Methylanthraquinone	03	1075.000
Methylaziridine	15	110.000
β-Methylbenzene propanal	07	57.070
Methylbenzene sulfonate	15	110.150
Methyl-2-benzimidazole carbamate	03	1464.300
Methyl benzoate	07	57.100
Methyl-p-benzoquinone	15	110.200
4-Methylbenzotriazole	03	1078.300
o-Methylbenzoyl chloride	03	1078.700
α-Methylbenzyl acetate (Styralyl acetate)	07	58.000
N-Methylbenzylamine	03	1079.000
o-Methylbenzyl chloride	03	1079.050
Methyl benzyl ether	03	1080.000
N-Methylbis(coconut oil alkyl)amine	12	441.000
N-Methylbis(hydrogenated tallow alkyl)amine	12	442.000
Methyl, bis-(2-hydroxyethyl) isodecyloxypropylammonium chloride	12	465.135
Methyl, bis-(2-hydroxyethyl) isotridecyloxypropyl ammonium chloride	12	465.140
Methyl, bis-(2-hydroxyethyl) soyaalkylammonium chloride	12	465.160
Methyl bromide (Bromomethane)	13	240.000
2-Methyl-1-butanol	15	841.000
3-Methyl-2-butenyl acetate	07	162.012
3-Methyl butyl butyrate	07	162.453
Methyl-1-(butylcarbamoyl)-2-benzimidazolecarbamate (Benomyl)	13	24.900
Methyl-t-butyl ether	14	184.000
2-Methylbutyl isovalerate	07	162.015
Methylbutyl pyrophosphate, ethylenedioxy titanium salt	12	100.200
Methyl butynol	07	162.020
Methylcellulose	14	411.000
Methyl chloroformate	15	1008.000
2-(2-Methyl-4-chlorophenoxy)propionic acid, diethanolamine salt	13	118.056
2-(2-Methyl-4-chlorophenoxy)propionic acid, iso-octyl ester	13	118.057
α-Methylcinnamaldehyde	07	59.000
Methyl cinnamate	07	60.000
Methyl cyanoacetate	15	448.650
Methylcyclohexane	03	1083.000
α-Methylcyclohexanemethanol	07	111.730

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
2-Methylcyclohexylamine	15	111.100
3-(N-Methyl-N-cyclohexylamino) -6-methyl-7-anilino fluora	15	111.200
1-(2-Methylcyclohexyl)-3-phenylurea (Siduron)	13	76.000
Methylcyclopentadienylmanganese tricarbonyl	14	185.000
2-Methyldecanal	07	162.458
Methyl-3,5-di-tert-butyl-y-hydroxyhydrocinnamate	15	111.500
Methyl 3-(2,2-dichloroethenyl)-2,2-dimethyl-3-cyano-3-phenoxyphenylcyclopropanecarboxylate	13	166.035
Methyl 3-(2,2-dichlorovinyl)-2,2-dimethylcyclopropane carboate	03	1084.150
Methyl didecylamine	12	442.800
Methyl dihydrogen phosphate	15	1034.000
5-Methyl-1,7-dihydroxy-1,3,4-triazaindolizine	14	366.000
Methyl 2-(4,6-dimethoxypyrimidin-2-yl) amino carbonyl amino sulfonyl methyl benzoate (Bensulfuron) (Londax)	13	76.045
Methyl N',N'-dimethyl-N-[(methylcarbamoyl)oxy] -1-thiooxamidate	13	231.010
Methyl 3,3-dimethyl-4-pentenoate	15	1009.200
Methyl 2-(4,6-dimethyl-2-pyrimidinyl) amino carbonyl amino sulfonyl benzoate	13	118.055
2-Methyl-4,6-dinitrophenol (4,6-Dinitro-o-cresol)	03	1084.700
4-Methyl-2,6-dinitrophenol	03	1084.703
N-Methyldioctadecylamine	12	443.000
Methyl dioleyl ethoxy ammonium methyl sulfate	12	465.250
Methyl-ditallowimidazolinium methosulfate	12	465.163
N-Methyldithiocarbamic acid, potassium salt	13	187.012
N-Methyldithiocarbamic acid,sodium salt (Metham)	13	241.000
Methyldopa	06	358.000
N-Methyleneaniline	03	1085.000
2,2'-Methylenebis(6-tert-butyl-p-cresol)	09	90.000
2,2'-Methylenebis(6-tert-butyl-4-ethylphenol)	09	91.000
2,2'-Methylenebis(4-chlorophenol) (dichlorophene)	13	40.025
4,4-Methylenebis(2,6-di-tert-butylphenol)	03	1088.100
4,4'-Methylenebis[N,N-diethylaniline]	03	1087.000
4,4'-Methylenebis[N,N-dimethylaniline] (Methane base)	03	1088.000
Methylene-bis(dimethyl)hydantoin and derivatives	14	166.000
2,2'-Methylenebis(4-methyl-6-nonyl-p-cresol)	03	1089.100
Methylenebis(thiocyanate)	13	195.010
Methylene-bridged polyalkyl phenols	14	208.000
Methylene chloride (Dichloromethane)	15	1234.000
4,4'-Methylenedianiline	03	1091.000
Methylenedicyclohexylmethane 1,4-diisocyanate	03	1091.300
1,2-Methylenedioxy-4-propylene benzene (isoSafrole)	07	60.600
Methylene diphenylamine (polymeric)	03	1091.700
5,5'-Methylenedisalicylic acid	03	1092.000
2-Methylene undecanal	07	163.200
Methyl esters of coconut oil	15	973.000
Methyl esters of lard	15	974.500
Methyl esters of tallow	15	975.000
Methyl ether (Dimethyl ether)	15	1321.000
Methyl ethyl ketone	15	826.500
Methyl ethyl sulfide	02	93.800

Chemical name	Sect. No.	Item No.
α-(1-methylethyl-x- 4-trifluore-methoxy]phenyl) -5- pyrimidinemethanol (Flurprimidol)	13	168.997
Methyl formate	15	1010.000
Methyl formcel	15	1450.000
Methyl p-formylbenzoate	03	897.500
Methyl furan	15	82.700
Methylglucoside laurate	12	713.000
1-Methyl-2-(8-heptadecenyl)-1-(9-octadecenyl) amido ethyl	12	476.850
N-(1-Methylheptyl)ethanolamine	14	185.500
N-(1-Methylheptyl)-N'-phenyl-p-phenylenediamine	09	64.000
5-Methyl-2-hexanone (Methyl isoamyl ketone)	15	827.000
Methyl hexyl ether	07	162.480
Methylhexyl ketone	15	826.800
p-Methylhydratropaldehyde	07	60.800
Methyl hydrazine, mono	15	424.200
4-methyl-5-hydroxymethyl imidazole	15	448.750
Methyl 12-hydroxystearate	15	976.000
(2,4-Methyl-5-imidazolyl)methylthioethylamine di hydrochloride	03	1094.853
2,2'-(Methylimino)diethanol (Methyldiethanolamine)	15	424.000
2-Methylindole	03	1094.900
Methylionone(α- and β-)	07	114.000
γ-Methylionone	07	114.100
6-Methyl-α-ionone	07	112.000
Methyl isobutyl ketone	15	828.000
Methyl isobutyrate	07	162.500
Methyl isodehydroacetate	15	1010.200
1-Methyl-isohexyl-hexahydro benzaldehyde	07	61.100
Methyl iso-octadecenoate	15	977.500
Methyl isothiocyanate and 1,3-dichloropropene	13	243.012
Methyl isovalerate	07	162.520
2-Methyllactonitrile (Acetone cyanohydrin)	15	449.000
Methyl linoleate	15	977.600
Methyl mercaptan (Methanethiol)	02	94.000
Methyl methacrylate-butadiene styrene (MBS) resins	08	44.041
Methyl methacrylate, monomer	15	1011.000
N-Methyl-methanamine with borane (1:1)	15	1368.600
Methyl N-methylanthranilate	07	62.000
Methyl-2-methyl butyrate	07	162.550
S-Methyl-N-[(methylcarbamoyl)oxy]thioacetimidate (Methomyl)	13	213.400
α-Methyl-3,4-methylene dioxyhydrocinnamaldehyde	07	62.200
4-Methyl-N-((4-methylphenyl)sulfonyl) benzenesulfonamide	03	1096.200
3-Methyl-N-[2(methylsulfonamidoethyl)-N-ethyl-p-phenylenediamine]sequisulfate monohydrate	14	367.500
4-Methylmorpholine	15	117.000
Methylnaphthalene	01	12.500
Methylnaphthalenesulfonic acid, sodium salt	12	173.000
Methyl nicotinate	03	1097.500
N-Methyl-p-nitroaniline	03	1102.000

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
4-Methyl-2-nitroanisole	03	1104.000
3-Methyl-2-nitrobenzcic acid	03	1106.020
2-Methyl-2-nitro-1-propanol	15	426.000
3-Methyl-2-and3nonene nitrile	07	162.750
Methylnonylnaphthalenesulfonic acid, sodium salt	12	174.000
2-Methyl-5-norbornene-2,3-dicarboxylic anhydride	03	1108.000
2-Methyl-1-octyl-1	03	1108.700
Methyl oleate	11	94.000
Methyl oleate, sulfated, sodium salt	12	261.000
N-Methyl-N-oleoyltaurine, sodium salt	12	184.000
Methylol methyl hexyl ketone	07	162.700
N-Methyl-N-palmitoyltaurine, sodium salt	12	185.000
2-Methyl-2,4-pentanediol (Hexylene glycol)	15	1089.000
2-Methyl-1-pentanol	15	863.000
4-Methyl-2-pentanol (1-Methylisobutylcarbinol)	15	864.000
4-Methyl-3-penten-2-one (Mesityl oxide)	15	829.000
N-(1-Methylpentyl)-N'-phenyl-p-phenylenediamine	09	64.200
Methyl pentynol	07	162.660
Methylphenidate hydrochloride	06	545.700
Methyl phenylacetate	07	63.000
3-Methyl-5-phenyl-1-pentanol	07	63.200
4-Methyl-1-phenyl-3-pyrazolidione	14	369.000
1-Methyl-3-phenyl-5-[3-(trifluoromethyl)phenyl]-4 (1H)- pyridone (Fluridone)	13	118.063
4-Methylphthalic acid	03	1120.502
4-Methylphthalic anhydride	15	118.700
4-(4'-Methylpiperidine)pyridine	03	1121.400
3-(2-Methylpiperidino)propyl-3,4-dichlorobenzoate (Pipron)	13	40.026
N-Methyl-N-polyoxyethylene-N,N-bis(hydrogenated tallow amidoethyl)ammonium	12	476.920
N-Methyl-N-polyoxyethylene-N,N-bis(tallow amidoethyl)	12	476.925
Methylprednisolone	06	663.000
2-Methyl-2-propanamine with borane(1:1)	15	1368.700
Methyl propionate	07	162.665
Methylpseudoionone	15	830.000
1-Methyl-2-pyrolidone,monomer	15	120.000
Methyl ricinoleate	11	110.000
Methyl salicylate	07	64.000
Methyl stearate	15	978.000
α-Methylstyrene	03	1125.000
ar-Methylstyrene (Vinyltoluene)	03	1125.100
α-Methyl styrene polymers	08	45.000
Methyl sulfate (Dimethyl sulfate)	15	1013.000
Methyl sulfide (Dimethyl sulfide)	15	1354.000
Methyl sulfoxide (Dimethyl sulfoxide)	15	1355.000
N-Methyl-N-(tall oil acyl)taurine, sodium salt	12	186.000
Methyl-1-tallowamidoethyl-2-tallowimidazolium-methyl sulfate	12	498.700
Methyltallowdiethylenetriamine condensate, polyethoxylated,methyl sulfate	12	465.200
Methyltallowdiethylenetriamine condensate, polypropoxylated, methyl sulfate	12	465.210
Methyltestosterone	06	641.200
Methyl tetrahydrofuran (Methyl THF)	15	82.800
Methyltetrahydrophthalic anhydride	15	120.300
Methylthiosulfonic acid, S-(2-hydroxypropyl) ester	13	205.925
Methyl tri(C9-10)ammonium chloride	12	499.900
1-Methyl-3,5,7-triaza-1-azonia tricyclodecane chloride	13	175.300
5-Methyl-1,2,4-triazolo[3,4-b]benzothiazole (Tricyclazole)	13	40.027
Methyltrimethoxysilane and polymethyltrisiloxane	15	1390.000
Methyltrioctylammonium chloride	12	499.000
2-Methylundecanal	07	163.000
Methyl vinyl ether	15	1322.000
Methyprylon	06	474.000
Metoclopramide hydrochloride	06	81.300
Metoprolol tartrate	06	358.300
Metronidazole	06	177.000
Metyrapone	06	578.000
Mexane-1,6-bis(tributyl ammonium bromide)	12	497.500
Mexylisonanylamidocarboxylic acid, monoethanolamine salt	12	26.150
Minocycline	06	35.000
Minoxidil	06	358.400
Miscellaneous acylic chemicals, all other	15	1423.000
Mixed acyclic primary amines, ethoxylated and sulfated, sodium salt	12	14.000
Mixed alcohol borates	15	1368.720
Mixed alcohols, ethoxylated	12	762.000
Mixed alkanesulfonic acid	12	211.000
Mixed alkane sulfonic acid, sodium salt	12	212.000
3-(Mixed alkoxy)propylamine, ethoxylated oxides	12	330.950
3-(3-Mixed alkoxy)propylaminopropyl amine	12	330.955
(Mixed alkyl)amine	12	423.000
(Mixed alkyl)amine, ethoxylated	12	331.000
(Mixed alkyl)amine phosphate	12	394.700
(Mixed alkyl)ammonium chloride	12	499.500
Mixed alkyl benzoate	12	714.450
Mixed t-α-alkylcarboxylic acid salts	15	671.100
(Mixed alkyl)dibenzyltrimethyl-1,3-propane diammonium chloride	12	527.580
Mixed alkyl imidazoline derivative, ethoxylated	12	465.300
(Mixed alkyl)phenol, alkoxylated	12	745.900
(Mixed alkyl)phenol alkylenediaminealkanolamine formaldehyde	12	782.950
(Mixed alkyl)phenol epichlorohydrin-formaldehyde, alkoxylated	12	722.100
(Mixed alkyl)phenol, ethoxylated	12	746.000
(Mixed alkyl)phenol, ethoxylated, butyl ether	12	747.000
(Mixed alkyl)phenol, ethoxylated and sulfated, sodium salt	12	286.000
(Mixed alkyl)phenol-formaldehyde, alkoxylated	12	722.000
(Mixed alkyl phenol formaldehyde, methoxylated	12	722.015
Mixed alkyl phenol sulfate, ethoxylated, triethanolamine salt	12	244.300
Mixed alkyl phoshate, sodium salt	12	102.100
Mixed alkyl phosphate	12	101.000
Mixed alkyl phosphate, alkylamine salt	12	101.500
Mixed alkyl phosphate, diethanolamine salt	12	102.000
Mixed alkyl phosphate, potassium salt	12	102.050
Mixed alkyl phosphate, triethanolanine salt	12	102.120

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
N-(Mixed alkyl)polyethylenepolyamine	12	412.000
Mixed alkyl stearate	12	714.520
(Mixed alkyl)sulfobetaine	12	15.000
Mixed alpha-olefins and vegetable	12	318.485
Mixed animal and vegetable oil, sulfated, sodium salt	12	299.800
Mixed aryl diimides	14	167.000
Mixed carboxylic acids	12	536.450
Mixed carboxylic acids	12	547.850
Mixed(coco and soya fatty acids), reaction products with chloromethane and diethylenetriamine, ethoxylated, quaternized	12	477.220
Mixed dialkyl hydrogen phosphates	15	1034.500
Mixed di and triethylene glycol mono ester of tall oil acid	12	714.600
Mixed ester of resin and rosin acids	12	660.450
Mixed fatty acid amide with diethylene triamine ethyl sulfate	12	477.226
Mixed fatty acid-ethoxylated nonyl phenol ester	12	783.500
Mixed fatty acids-alkylenediamine condensate, polyethoxylate	12	377.000
Mixed fatty acids, alkyl ether, ethoxylated	12	671.100
Mixed fatty acids camine acid ratio = 1/1	12	547.855
Mixed fatty acids, diethanolamine condensate	12	578.800
Mixed fatty acids, neutralized	12	536.570
Mixed fatty acids-polyalkylenepolyamine condensate	12	361.000
Mixed fish oils, sulfated, ammonium salt	12	299.990
Mixed fish oils, sulfated, sodium salt	12	300.000
Mixed higher glycol amine (MHGA)	15	430.500
Mixed linear alcohols, alkoxylated, all other	12	741.000
Mixed linear alcohols, alkoxylated	12	736.950
Mixed linear alcohols, alkoxylated and phosphated, potassium salt	12	87.007
Mixed linear alcohols, ethoxylated	12	737.000
Mixed linear alcohols, ethoxylated, benzyl ether	12	737.100
Mixed linear alcohols, ethoxylated and carbonated, sodium salt	12	318.500
Mixed linear alcohols, ethoxylated and phosphated	12	87.000
Mixed linear alcohols, ethoxylated and phosphated, sodium salt	12	87.010
Mixed linear alcohols, ethoxylated and propoxylated	12	738.000
Mixed linear alcohols, ethoxylated and sulfated, ammonium salt	12	276.000
Mixed linear alcohols, ethoxylated and sulfated, diethanolamine salt	12	276.500
Mixed linear alcohols, ethoxylated and sulfated, sodium salt	12	278.000
Mixed linear alcohols, sulfated, ammonium salt	12	232.000
Mixed linear alcohols sulfated, mixed sodium cocodiethanolamine salts	12	232.520
Mixed linear alcohols, sulfated, sodium salt	12	233.000
Mixed linear alcohols, sulfated, triethanolamine salt	12	233.100
(Mixed linear alkyl)dimethyl ammonium methyl sulfate	12	500.100
Mixed linear olefin sulfonate	12	212.125
Mixed oleic, lauric, stearic, and palmitic hexaglycerol esters	12	692.000
Mixed polyesters	14	284.000
Mixed(secondary linear alcohol)polyethylene propionic acid, sodium salt	12	45.700
Mixed tall oil and rosin acids, ethoxylated	12	671.300
Mixed vegetable fatty acids, potassium salt	12	59.000
Mixed vegetable fatty acids, sodium salt	12	58.990
Mixed vegetable oils, sulfated, sodium salt	12	307.900
Mixed vegetable oils, sulfated, sodium salt	12	308.000
Mixed wool grease and tall oil fatty acids	12	74.050
Mixture of N-octyl, N-decyl, N,N-dimethyl ammonium chloride and benzyl, dimethyl, (mixed alkyl) ammonium chloride	12	499.600
Mixtures not specifically itemized, all other	15	1500.000
Mixtures of alcohols, C_{12} and higher, other	15	883.360
Modified ethylene-propyene copolymers	14	284.500
Modified rosin (Unesterified)	08	41.000
Modified rosin esters	08	40.000
Monesin	06	68.000
Mono-,di-,and triesters of phenyl(2,3,4-trihydroxyphenyl) methanone with 6-diazo-5,6-dihydro-5- oxo-1-naphthalene sulfonic acid	03	1345.500
Monoethanolamine	15	379.000
Monohydric alcohol esters, all other	15	1070.000
Monoisopropanolamine	15	407.000
Monomethylacetoacetamide	15	248.100
Monomethyl tin	15	1404.877
Mordant Brown 1	04	871.000
Mordant Brown 18	04	875.000
Mordant Brown 33	04	878.000
Mordant Brown 70	04	882.000
Mordant Orange 1	04	848.000
Mordant Orange 6	04	850.000
Mordant Red 7	04	855.000
Mordant Yellow 1	04	836.000
Morphine sulfate	06	405.500
Morpholine	15	121.000
Morpholine residue stream	15	1440.000
Morpholine salt of p-toluene sulfonic acid	15	122.000
N-Morpholinyl-2-benzothiazolyl disulfide	09	33.000
p-Morpholinyl-2,5-dibutoxybenzene diazonium chloride	14	370.000
Mustard seed oil, sulfated, sodium salt	12	309.000
Myrcene	15	1343.000
Myrcenyl acetate	07	163.800
Myristaldehyde	07	164.000
Myristic acid (Ratio=1/1)	12	547.900
Myristic acid esters, all other	11	89.000
Myristyl alcohol, propoxylated	12	738.300
Myristylbenzyldimethylammonium chloride.$2H_2O$	03	1418.000
Myristyl bromide	15	1213.500
Myristyl ethoxy myristate	11	88.600
Myristyl lactate	15	1015.000
Myristyl myristate	15	979.000
Myristyl stearate	15	979.100
Myristyl stearate	11	124.525
Nadolol	06	358.500
Nafcillin, sodium	06	17.000

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
Naphazoline hydrochloride	06	336.000
1-Naphthaldehyde	03	1133.800
Naphthalene	02	17.000
Naphthalene, crude, solidifying at less than 74° C	01	12.000
Naphthalene, crude, solidifying at 76° C to less than 79° C	01	14.000
Naphthalenesulfonates, all other	12	176.000
2-Naphthalenesulfonic acid	03	1141.000
1-Naphthalenesulfonic acid, formaldehyde condensate and salt	14	465.000
2-Naphthalenesulfonic acid, formaldehyde condensate and salt	14	466.000
1-Naphthalenesulfonic acid, 8-(phenylamino)-monosodium salt	03	1308.500
Naphthalene sulfonic acid, polymer with formaldehyde and 4,4'-dihydroxydiphenyl sulfone	12	722.445
Naphthalene sulfonic acid, polymer with formaldehyde, sodium salt	12	722.500
2-Naphthalenesulfonic acid, sodium salt	03	1143.000
Naphthalene sulfonic acid, sodium salt, formaldehyde condensate	12	174.500
Naphthalimide	03	1148.000
Naphthenate driers, mixed salts	14	310.000
Naphthenic acid, acid number 150-199	02	19.000
Naphthenic acid, acid number 200-224	02	20.000
Naphthenic acid, acid number 225-249	02	21.000
Naphthenic acid, acid number less than 150	02	18.000
Naphthenic acid, copper salt	13	26.000
Naphthenic acid, ethoxylated	12	45.800
Naphthenic acids-polyalkylene polyamine condensate	12	361.150
Naphthenic acids-tall oil fatty acids-polyalkylene polyamine condensate	12	361.200
1-Naphthol, ethoxylated and sulfated, free acid	12	286.090
Naphthol reds, all other	05	46.000
1-Naphthylamine (α-Naphthylamine)	03	1158.000
p-(2-Naphthylamino)phenol (N-(p-Hydroxyphenyl)-2-naphthylamine)	03	1160.000
N-1-Naphthylphthalamic acid (NPA)	13	77.900
Naphtmalene sulfonic acid, polymer with formaldehyde and 4,4'-dihydroxydiphenyl sulfone, ammonium salt	12	722.450
Natural fats and oils, ethoxylated, all other	12	673.000
(NBR) type	10	12.000
Neat's foot oil, sulfated, sodium salt	12	294.000
Neo-C_9-C_{12} acids	15	555.970
Neoalkoxy, dodecylbenzene-sulfonyl titanate	12	137.500
Neoalkoxy, tri(m-amino)-phenyl titanate	12	331.850
Neoalkoxy, trineodecanoyl titanate	12	59.600
Neoalkoxy, trineodecanoyl zirconate	12	59.620
Neoalkoxy, tris(m-amino) phenyl zirconate	12	331.890
Neoalkoxy tris(dioctyl) pyrophosphato zirconate	12	102.550
Neoalkoxy, tris (ethylene diamino) zirconate	12	331.870
Neodecanoic acid	15	556.000
Neodecanoyl chloride	15	557.000
Neoheptanoyl chloride	15	557.100
Neohexane (2,2-Dimethylbutane)	02	67.000
Neomycin (medicinal grade)	06	52.000
Neomycin (animal feed grade)	06	69.000
Neopentyl glycol adipate	11	64.500
Neopentyl glycol dioleate	11	94.250
Neopentyl glycol glutarate	11	85.650
Neophyl chloride	15	1239.810
Neostigmine methylsulfate	06	317.000
Netilmicin	06	62.001
Niacin (medicinal grade)	06	779.000
Niacinamide (medicinal grade)	06	780.500
Niacinamide hydroiodide	06	781.000
Nickel acetate	15	601.000
Nickel 2-ethylhexanoate	15	640.000
Nicotine polacrilex	06	836.000
Nicotinonitrile (3-Cyanopyridine)	03	1162.000
Nicotinyl alcohol tartrate	06	373.000
Nifedipine	06	374.200
Nitarsone	06	158.000
Nitrated lard oil	15	431.000
Nitriles, all other	15	457.000
Nitriloacetic acid, zinc salt	14	85.000
Nitrilotriacetic acid	14	78.000
Nitrilotriacetic acid, trisodium salt	14	81.000
Nitrilo-tris-methylene triphosphonic acid	14	82.000
Nitrilo-tris-methylene triphosphonic acid, potassium salt	14	83.000
Nitrilo-tris-methylene triphosphonic acid, sodium salt	14	84.000
o-Nitroaniline	03	1172.000
p-Nitroaniline	03	1173.000
5-Nitroanthranilic acid	03	1184.000
1-Nitroanthraquinone	03	1185.000
p-Nitrobenzamide	03	1187.503
Nitrobenzene	03	1190.000
m-Nitrobenzenesulfonic acid, sodium salt	03	1195.000
5-Nitrobenzimidazole nitrate	14	372.000
o-Nitrobenzoic acid	03	1200.503
m-Nitrobenzoic acid	03	1200.000
p-Nitrobenzoic acid	03	1201.000
m-Nitrobenzoic acid, sodium salt	03	1205.000
2-Nitro-N-benzoylaniline	03	1205.603
2-Nitro-p-cresol	03	1210.000
5-Nitrodimethylisophthalate	03	1215.150
Nitrodiphenylamine	03	1212.000
Nitroethane	15	459.000
Nitrogenous compounds, acyclic, all other	15	484.000
5-Nitroisophthalic acid	03	1215.000
Nitromethane	15	460.000
3-Nitro-4-methylacetophenone	03	1215.350
Nitromide	06	182.000
1-Nitronaphthalene	03	1216.000
p-Nitrophenethyl alcohol	03	1224.000
o-Nitrophenol	03	1227.000
p-Nitrophenol	03	1228.000
p-Nitrophenol, sodium salt	03	1229.000
2-Nitro-N'-phenyl-p-phenylenediamine	03	1232.500
1-Nitropropane	15	461.000

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
2-Nitropropane	15	462.000
3-Nitro-6-pyrrolodinyl toluene	03	1237.500
5-Nitrosalicylaldehyde	03	1238.000
p-Nitrosophenol	03	1240.000
4-Nitrosophenol, sodium salt	03	1240.100
N-Nitrosophenylhydroxylamine salt	15	122.450
o-Nitrotoluene	03	1244.000
m-Nitrotoluene	03	1243.000
p-Nitrotoluene	03	1245.000
Nitrotoluene mixtures	03	1246.000
(2-Nitro-4-trifluoromethylphenyl)acetic acid	03	1255.500
Nizatidine	06	620.800
Nonanal	07	165.000
n-Nonane	15	1344.000
1,3-Nonanediol acetate	07	165.200
Nonanoic acid (Pelargonic acid)	15	559.000
Nonanol	07	165.300
Nonanoyl chloride	15	559.050
Nonene (Tripropylene)	02	80.000
Nonenylsuccinic anhydride	15	165.770
Nonionic surface-active agents, all other	12	787.000
Non-nylon type,polyamide resins	08	27.000
Nonyldiphenylamine mixture (Mono-, di-, and tri-)	09	76.700
tert-Nonyl mercaptan	09	171.250
Nonylphenol	03	1262.000
Nonylphenol, alkoxylated/aminated	15	122.462
Nonylphenol, barium salt	14	229.000
Nonylphenol, ethoxylated	12	749.000
Nonylphenol, ethoxylated and carbonated, sodium salt	12	318.640
Nonylphenol, ethoxylated and phosphated	12	82.000
Nonylphenol, ethoxylated and phosphated, diethanolamine salt	12	83.100
Nonylphenol, ethoxylated and phosphated, sodium salt	12	83.200
Nonylphenol, ethoxylated, phosphate esters	12	750.010
Nonylphenol, ethoxylated and propoxylated	12	750.000
Nonylphenol, ethoxylated and sulfated, ammonium salt	12	287.000
Nonylphenol, ethoxylated and sulfated, sodium salt	12	288.000
Nonylphenol, ethoxylated, with fumaric acid	12	750.045
Nonyl phenol, ethoxylated with mixed fatty acids	12	750.050
Nonyl phenol ethoxylate, oleate	12	714.650
Nonylphenol-formaldehyde, alkoxylated	12	723.000
Nonylphenol glycidyl ether	15	122.470
Nonyl phenol oleate, ethoxylated	12	749.500
Nonylphenol poly(ethyleneoxy)acetic acid, sodium salt	12	45.900
Nonylphenyl phosphites, mixed	09	85.000
Nopeopentyl glycol dicaprate	15	1126.400
Nopol	07	114.950
Nopyl acetate	07	115.000
2-Nor-tall oil alkyl-1-tall oil amido-ethyl imidazoline	12	361.050
Nortriptyline hydrochloride	06	531.000
Noscapine	06	434.500
Novobiocin (animal feed grade)	06	70.000
Novobiocin, sodium	06	53.000
Nylon 6 (Polymer for fiber, only)	14	388.000
Nylon 6/6	14	389.000
Nylon type, polyamide resins	08	26.000

Chemical name	Sect. No.	Item No.
Nystatin (medicinal grade)	06	3.000
Ocimene	07	165.700
Ocimenyl acetate	07	165.800
Octabromodiphenyl oxide	15	122.500
Octachlorohexahydro-4,7-methanoindene (Chlordan)	13	143.000
n-Octadecane	15	1346.000
Octadecanoic acid, 2-(1-carboxyehtoxy)-1-methyl-2-oxoethyl er, sodium salt	15	1355.150
1-Octadecanol (Stearyl alcohol)	15	877.000
cis-9-Octadecen-1-ol (Oleyl alcohol)	15	878.000
9-Octadecenyl acetate, sulfated, sodium salt	12	267.800
9-Octadecenyl alcohol, ethoxylated	12	731.000
9-Octadecenyl alcohol, ethoxylated and phosphated	12	84.000
9-Octadecenylamine	12	424.000
(9-Octadecenyl)amine, ethoxylated	12	332.000
Octadecenyl succinic anhydride	15	165.800
N-(9-Octadecenyl)trimethylenediamine	12	413.000
Octadecyl alcohol, ethoxylated	12	732.000
Octadecylamine	12	425.000
Octadecylamine acetate	12	396.000
Octadecylamine, ethoxylated	12	333.000
Octadecyl-3-(3,5-di-tert-butyl-4-hydroxyphenyl) propionate	15	124.000
N-Octadecyl-N,N-di(2-hydroxyethyl)-N-methylammonium chloride	12	465.400
Octadecyl-3-mercaptopropionate	15	1016.000
N-Octadecylsulfosuccinamic acid, disodium salt	12	179.000
Octahydro-5-methoxy-4,7-methano-1H-indene, 2-carboxaldehyde	07	64.600
Octanal	07	166.000
n-Octane	15	1348.000
n-Octane	02	75.000
n-Octanesulfonic acid, sodium salt	12	212.100
1-Octanol	15	866.000
2-Octanone (Hexyl methyl ketone)	15	831.000
3-Octanone (Ethyl amyl ketone)	07	166.200
Octanoyl chloride	15	561.000
2-Octanoylhydroquinone	03	1264.300
Octenes, mixed	02	75.700
Octenylsuccinic anhydride	15	165.820
N-Octyl acetate	07	166.300
tert-Octylamine	15	293.100
Octyl chloride	15	1241.000
n-Octyl n-decyl adipate	11	65.000
Octyl decyl dimethyl ammonium chloride	12	500.700
N-Octyl, N-decyl, N,N-dimethyl ammonium chloride	12	483.200
n-Octyl n-decyl phthalate	11	49.000
2-Octyldecyl-12-stearoyl stearate	11	124.540
Octyldimethylamine oxide	12	333.050
Octyldiphenylamine	09	77.000
Octyldiphenylamine, alkylated	09	78.000
Octyl diphosphate, oxoethylene titanium salt	12	104.600
Octyl epoxystearates	11	78.000
Octyl formate	07	166.355
N-n-Octyl glucamine	15	464.500
Octyl isobutyrate	07	166.358

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
2-n-Octyl-4-isothiazolin-3-one	13	25.500
Octyl isovalerate	07	166.360
n-Octyl mercaptan	09	171.400
Octyl mercaptans	02	95.010
Octylmethoxy cinnamate	15	124.800
Octylphenol	03	1265.000
n-Octylphenol, ethoxylated	12	752.000
Octylphenol, ethoxylated and phosphated	12	85.000
Octylphenol, ethoxylated and phosphated, magnesium salt	12	86.000
tert-Octylphenol-formaldehyde, ethoxylated	12	724.000
Octylphenoxydiethoxy chloride	03	1265.118
Octylphenoxy polyethoxy ethyl sulfate	12	290.100
Octyl phosphate, alkylamine salt	12	106.000
Octyl phosphate, isoproxy titanium salt	12	106.400
Octyl phosphate neoalkoxy titanium salt	12	106.700
Octyl polyphosphate	12	108.000
Octyl polyphosphate, potassium salt	12	109.000
Octyl pyrophosphate, ethylenedioxy titanium salt	12	110.100
Octyl pyrophosphate, ethylenedioxy titanium salt/ dimethylamino methacrylate salt	12	110.110
Octyl pyrophosphate, isoproxy titanium salt	12	110.150
Octyl pyrophosphate neoalkoxy titanium salt	12	110.160
Octyl pyrophosphate, oxoethylenedioxy titanium salt	12	110.170
Octyl sulfate, sodium salt	12	238.000
N-Octyltriethoxy silane	15	1390.500
Oil-soluble petroleum sulfonate, all other	14	217.000
Oil-soluble petroleum sulfonate, ammonium salt	14	211.000
Oil-soluble petroleum sulfonate, barium salt	14	212.000
Oil-soluble petroleum sulfonate, calcium salt	14	213.000
Oil-soluble petroleum sulfonate, magnesium salt	14	214.000
Oil-soluble petroleum sulfonate, sodium salt	14	215.000
Oleamide (Octadecene amide)	15	250.000
Oleamidopropyl betaine	12	15.900
Oleamidopropyldimethyl amine	12	387.500
Oleamidosulfosuccinamic acid, disodium salt	12	179.900
Oleic acid (Ratio = 1/1)	12	548.000
Oleic acid (Ratio = 2/1)	12	538.000
Oleic acid	15	563.000
Oleic acid, ammonium salt	12	59.800
Oleic acid, diethanolamine salt	12	29.990
Oleic acid-diethylenetriamine condensate	12	363.000
Oleic acid-N,N-dimethyltrimethylenediamine condensate	12	365.000
Oleic acid, epoxidized, ammonium salt	12	59.900
Oleic acid esters, all other	11	96.000
Oleic acid-ethanolamine condensate, ethoxylated	12	579.000
Oleic acid, ethoxylated and propoxylated	12	671.505
Oleic acid-ethylenediamine condensate, propoxylated and sulfated, sodium salt	12	16.000
Oleic acid, mixed isopropanolamine salt	12	30.400
Oleic acid, potassium salt	12	60.000
Oleic acid, sodium salt	12	61.000
Oleic acid, sulfated	12	261.600
Oleic acid, sulfated, disodium salt	12	261.700
Oleic acid, sulfated, sodium salt	12	261.800
Oleic acid, triethanolamine salt	12	31.000
N-(Oleoyloxyisopropyl)sulfosuccinamic acid	12	180.000
Oleoylpalmitamide	15	251.000
Oleyl acid phosphate	14	209.000
Oleyl alcohol, ethoxylated	12	732.100
Oleyl betaine	12	16.100
Oleyl oleate	11	94.500
Oleyl sulfate, sodium salt	12	238.200
Olive oil acids, sodium salt	12	62.000
Organo-aluminum compounds, all other	15	1367.000
Organo-boron compounds, all other	15	1371.000
Organo-magnesium compounds, all other	15	1378.000
Organo-silicone compounds, all other	15	1399.000
Organo-tin compounds, all other	15	1407.000
Organotin mercaptides	15	1404.890
Ormetoprim	06	265.500
Orphenadrine citrate	06	479.500
Other copolymer resins of acrylic and/or methacrylic acid esters	08	20.000
Other ethylene copolymer resins	08	31.800
Other homopolymer resins of acrylic and/or methacrylic acid esters	08	20.050
Other hydrolytic enzymes	14	120.000
7-Oxabicyclo-[2.2.1]-heptane-2,3-dicarboxylic acid, disodium salt (Endothall)	13	83.000
Oxacillin, sodium	06	18.000
Oxalyl bis(benzylidene hydrazide)	15	125.490
Oxamide	15	251.250
Oxidate light ends	15	1451.000
Oxidized Fischer-Tropsch wax	15	566.000
Oxidized hydrocarbon mixture	14	218.000
Oxoalcohol bottoms, sulfated, sodium salt	12	238.500
Oxoaluminum isopropoxide	15	1363.050
Oxoaluminum stearate	15	1363.100
3-Oxo-1,2-benzisothiazoline-2-acetic acid, methyl ester, 1,1-dioxide	03	1272.000
5-Oxo-1-phenyl-2-pyrazoline-3-carboxylic acid, ethyl ester	03	1273.000
Oxo process bottoms	15	1451.300
Oxtriphylline	06	745.800
Oxyaluminum benzoate	03	1275.700
Oxy-aluminum octanoate	15	1363.200
p,p'-Oxybis(benzenesulfonhydrazide)	09	109.000
Oxybutynin chloride	06	301.500
Oxycodone hydrochloride	06	406.000
Oxycodone terephthalate	06	406.100
4,4'-Oxydianiline	03	1275.000
N-Oxydiethylene-2-benzothiazolesulfenamide	09	34.000
N-Oxydiethylenethiocarbamyl-N'-oxydiethylenesulfenamide	09	34.100
Oxygen-containing quaternary ammonium salts (Except those having amide linkages), all other	12	467.000
Oxyphencyclimine hydrochloride	06	302.000
Oxytetracycline (medicinal grade)	06	36.000
Oxytetracycline (animal feed grade)	06	72.000
Palmitic acid esters, all other	11	101.000
Palmitic and stearic acids (Ratio = 2/1)	12	540.000

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
Palmitic and stearic acids, sodium salt	12	63.350
Palmitoyl chloride	15	567.000
Palm kernel oil acids (Ratio=1/1)	12	549.100
Palm kernel oil acids, potassium salt	12	62.890
Palm kernel oil acids, sodium salt	12	62.900
Palm oil acids–ethylenediamine condesate, monoethoxylated	12	379.000
Palm oil acids, sodium salt	12	63.000
Panthenol	06	790.000
Papain	14	102.000
para-Cymene	07	95.400
Paraffin oils, chlorinated	15	1241.500
n-Paraffins, other	02	85.000
n-Paraffins, C_{10}–C_{14}	02	84.000
n-Paraffins, C_{10}–C_{16}	02	84.250
n-Paraffins, C_{12}–C_{18}	02	84.260
n-Paraffins, C_6–C_9	02	81.000
n-Paraffins, C_9–C_{15}	02	83.000
Paraformaldehyde	15	1176.500
Parahydroxyphenylglycine potassium methyl dane salt	03	1121.650
Peanut oil, sulfated, sodium salt	12	310.000
Pecan oil, sulfated, sodium salt	12	309.900
Pectinase	14	116.000
Pelargonic acid (Ratio = 2/1)	12	541.000
Pelargonic acid, calcium salt (Calcium nonoate)	15	730.200
Pelargonic acid esters, all other	11	101.500
Pelargonic acid–tetraethylenepentamine condensate	12	366.000
Pemoline	06	547.500
Penicillin G, benzathine	06	21.000
Penicillin G, potassium	06	22.000
Penicillin V, potassium	06	29.000
Penicillin G, procaine (animal feed grade)	06	74.000
Penicillin G, procaine (medicinal grade)	06	23.000
Pentabromochlorocyclohexane	03	1275.300
Pentachlorophenol, sodium salt	13	29.000
Pentaerythritol	15	1091.000
Pentaerythritol distearate	12	715.000
Pentaerythritol esters	14	286.000
Pentaerythritol stearate	15	1129.000
Pentaerythritol stearate	12	715.100
Pentaerythritol tetraacrylate	15	1130.000
Pentaerythritol tetrakis (3-Mercaptopropionate)	15	1131.000
Pentaerythritol tetraoleate	12	715.300
Pentaethylenehexamine	15	294.000
N,N,N',N',N'-Pentamethyl-N-(tallow alkyl) trimethylene [bisammonium chloride]	12	501.000
Pentamidine isethionate	06	270.700
n-Pentane	02	55.000
1,5-Pentanediol	15	1092.000
2,4-Pentanedione (Acetylacetone)	15	833.000
1-Pentanol	15	843.000
3-Pentanone (Diethyl ketone)	15	835.000
Pentazocine	06	416.001
Pentazocine hydrochloride	06	416.003
2-Pentene	02	57.000
Pentenes, mixed	02	58.000
Pentobarbital	06	456.000
Pentylamine, mono	15	296.000
α-Pentylcinnamaldehyde	07	65.000
o-Pentylphenol (o-Amylphenol)	03	1279.000
p-tert-Pentylphenol	03	1279.100
Pepsin	14	103.000
Perchloroethylene (Tetrachloroethane)	15	1243.000
Perchloromethanethiol (Perchloromethyl mercaptan)	15	1410.000
Perfluoroalkyl polyether	15	1410.100
Permethrin acid chloride	03	1279.600
Peroxyacetic acid (Peracetic acid)	15	1296.430
Perphenazine	06	486.000
3,4,9,10-Perylenetetracarboxylic acid	03	1280.000
3,4,9,10-Perylenetetracarboxylic-3,4:9,10-dianhydride	03	1280.503
3,4,9,10-Perylenetetracarboxylic-3,4:9,10-diimide	03	1281.000
Pesticides and related products, acyclic, all other	13	245.000
Pesticides and related products, cyclic, all other	13	175.000
Petroleum hydrocarbon resins	08	24.000
Petroleum sulfonic acid, calcium salt	12	207.090
Petroleumsulfonic acid, water soluble (Acid layer), sodium salt	12	213.000
1,10-Phenanthroline	03	1281.950
Phendimetrazine	06	548.000
Phenethyl acetate	07	66.000
Phenethyl alcohol	07	67.000
2-Phenethylamine	03	1282.000
Phenethyl bromide	15	125.945
Phenethyl formate	07	68.000
Phenethyl isobutyrate	07	69.000
Phenethyl isovalerate	07	70.000
2-Phenethyl phenylacetate	07	71.000
1-Phenethyl-2-picolinium bromide	12	527.700
Phenethyl propionate	07	72.000
Phenethyl salicylate	07	73.000
p-Phenetidine	03	1286.000
Phenindamine tartrate	06	102.000
Phenobarbital	06	458.000
Phenobarbital, sodium	06	459.000
Phenol, alkylated	09	101.000
Phenol, benzylated	03	1298.103
Phenol, ethoxylated	12	754.000
Phenol, ethoxylated and phosphated	12	88.000
Phenol, ethoxylated and phosphated, diethanolamine salt	12	88.100
Phenol-formaldehyde resin (with lignite)	12	725.100
Phenol glycidyl ether	15	125.948
Phenol, hindered	09	102.000
Phenolic antioxidants, all other	09	105.000
Phenolic and other tar acid resins	08	9.000
Phenol, natural, from petroleum, all other	03	1292.000
Phenol, natural, from petroleum, U.S.P.	03	1291.000
Phenol salts, all other	14	231.000
Phenols, ethoxylated, all other	12	758.000
Phenol, styrenated	03	1298.703
Phenol, styrenated, mixtures	09	103.000
Phenolsulfonaphthalein, sodium salt	03	1299.000

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
Phenol-sulfonated formaldehyde rosin	15	125.960
Phenolsulfonic acid	03	1299.200
1-Phenol-2-sulfonic acid,formaldehyde condensate (Phenol-formaldehyde,sulfonated)	14	467.000
Phenolsulfonic acid, sodium salt	03	1299.802
Phenol, sulfurated	14	493.000
Phenol, synthetic, all other	03	1298.000
Phenol, synthetic, from chlorobenzene by vapor-phase hydrolysis, U.S.P.	03	1296.000
Phenol, synthetic, from cumene by oxidation, U.S.P.	03	1297.000
Phenol, synthetic, from toluene by oxidation, U.S.P.	03	1298.050
Phenoxyacetic acid, sodium salt	03	1299.600
3-Phenoxybenzaldehyde	03	1299.613
3-Phenoxybenzaldehyde cyanohydrin	03	1299.617
3-Phenoxybenzenemethanol	03	1299.618
2-Phenoxyethanol (Ethylene glycol monophenyl ether)	15	127.000
2-Phenoxyethyl isobutyrate	07	74.000
Phenoxyethyl propionate	07	74.200
3-(Phenoxyphenyl) methyl-cis, trans-3-(2,2 dichloroethenyl)-2,2-dimethyl cyclopropanecarboxylate	13	166.025
Phenoxy (R) resin (other than for coating and adhesives)	08	25.000
m-Phenoxytoluene	03	1299.750
Phensuximide	06	423.000
Phentermine	06	549.000
Phentermine hydrochrloride	06	549.500
Phenylacetaldehyde	07	75.000
Phenylacetaldehyde,dimethyl acetal	07	76.000
Phenylacetic acid	07	76.050
Phenylacetic acid isopentyl ester	07	76.055
4'-Phenylacetophenone	03	1308.000
Phenyl acid phosphate	15	129.300
Phenyl acid phosphate	14	168.000
Phenyl alanine	14	16.000
α-Phenylanisole	07	76.350
4-(Phenylazo)diphenylamine	03	1311.000
2-Phenylbenzimide	03	1312.600
Phenylbutazone	06	412.000
4-Phenyl-3-buten-2-one	07	77.000
Phenyldiisodecyl phosphite	15	129.600
m-Phenylenebismaleimide	03	1321.200
m-Phenylenebismaleimide	09	45.000
o-Phenylenediamine	03	1320.000
m-Phenylenediamine	03	1319.000
p-Phenylenediamine	03	1321.000
p-Phenylenediamines, substituted, other	09	65.000
Phenylephrine bitartrate	06	340.000
Phenylephrine hydrochloride	06	341.000
Phenylephrine tannate	06	342.000
Phenyl ether (Diphenyl oxide)	03	1322.000
d(+)α-Phenylethylamine	03	1322.025
Phenylethyl benzoate	07	77.100
Phenyl glycidyl ether	15	131.500
N-Phenylglycine	03	1322.850
α-D-Phenylglycine methyl ester K	15	131.600
Phenylglycine, sodium salt	03	1323.000
1-Phenyl-2-hydroxy-2-methyl-propanone-1	15	132.100
2,2'-[(Phenyl)imino] diethanol (N-Phenyldiethanolamine)	03	1327.000
2,2'-[(Phenyl)imino] diethanol, diacetate ester	03	1327.500
Phenyl-5-mercaptotetrazole	14	375.000
Phenylmercuric acetate (PMA)	13	15.500
Phenylmercuric ammonium acetate	13	16.000
Phenylmercuric carboxylate	03	1329.050
Phenylmercuric oleate	13	20.000
N-Phenyl-1-naphthylamine	15	134.000
o-Phenylphenol	03	1330.000
p-Phenylphenol	03	1331.000
o-Phenylphenol, sodium salt	03	1333.000
N-Phenyl-p-phenylenediamine	03	1334.000
1-Phenyl-1,2-propanedione, 2-oxime	03	1338.000
3-Phenyl-1-propanol (Hydrocinnamic alcohol)	07	78.000
Phenylpropanolamine	15	134.660
Phenylpropanolamine bitartrate	06	343.500
Phenylpropanolamine hydrochloride	06	343.000
3-Phenylpropyl acetate	07	79.000
3-Phenylpropyl cinnamate	07	79.200
4-Phenylpropylpyridine	03	1339.853
1-Phenyl-3-pyrazolidone	14	377.000
Phenylstyrene, ethoxylated	12	754.080
5-Phenyltetrazole	09	109.200
Phenyltoloxamine citrate	06	104.000
Phenyltriethoxysilane	03	1342.250
Phenyl xylyl ethane	15	134.800
1-Phenysal-1,2-propanidione	07	115.150
Phenytoin	06	423.300
Phenytoin, sodium	06	423.600
Phosgene (Carbonyl chloride)	15	1411.000
Phosphonate ester, cyclic	15	134.900
2-Phosphonobutane-1,2,4-tricarboxylic acid, sodium salt	14	86.000
N-(Phosphonomethyl)glycine, isopropylamine salt	13	205.950
N-(Phosphonomethyl)glycine, sodium sesqui salt	13	231.592
Phosphoric acid esters, all other	11	16.000
Phosphoric and polyphosphoric acid esters, all other	12	113.000
Phosphorodithioates used as lubricating oil and grease additives, all other	14	244.000
Phosphorus acid esters, all other	15	1049.000
Photographic chemicals, all other	14	383.000
Phthalic acid	03	1346.000
Phthalic acid, diallyl ester	11	23.400
Phthalic acid, lead salt, (Dibasic)	15	135.000
Phthalic anhydride	03	1348.000
Phthalic anhydride esters, all other	11	51.000
Phthalic anhydride type alkyd resins	08	2.000
Phthalimide	03	1351.000
[Phthalocyaninato(2-)] copper	03	1352.000
[Phthalocyaninetetramethanaminato] copper	03	1353.300
Phthalocyaninetetrasulfonyl chloride, copper derivative	03	1353.800
Phthaloyl chloride (Phthalyl chloride)	03	1355.000

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
Picoline (3,4-mixture)	03	1359.000
2-Picoline (α-Picoline)	03	1356.000
3-Picoline (β-Picoline)	03	1357.000
4-Picoline (γ-Picoline)	03	1358.000
3-Picoline-N-oxide	03	1359.003
Picolinonitrile (2-Cyanopyridine)	03	1359.100
3-Picolylamine	03	1361.000
Picramic acid, sodium salt	15	136.000
Picric acid (Trinitrophenol)	03	1362.000
Pigment Black 7	05	143.007
Pigment black toners, all other	05	144.000
Pigment Blue 1, (PMA)	05	99.000
Pigment Blue 1, (PTA)	05	100.000
Pigment Blue 2, (PMA)	05	102.000
Pigment Blue 14, (PMA)	05	111.000
Pigment Blue 15, (α form)	05	113.010
Pigment Blue 15:1, (α form)	05	113.020
Pigment Blue 15:2, (α form)	05	113.030
Pigment Blue 15:3, (β form)	05	114.010
Pigment Blue 15:4, (β form)	05	114.020
Pigment Blue 19	05	116.000
Pigment Blue 25	05	119.000
Pigment Blue 61	05	120.061
Pigment blue 62	05	120.062
Pigment blue toners, all other	05	124.000
Pigment Brown 5	05	140.000
Pigment Green 1, (PMA)	05	125.000
Pigment Green 2, (PTA)	05	128.000
Pigment Green 4, (fugitive)	05	129.000
Pigment Green 4, (PMA)	05	130.000
Pigment Green 7	05	132.000
Pigment Green 8	05	133.000
Pigment Green 10	05	134.000
Pigment Green 36	05	134.260
Pigment green toners, all other	05	135.000
Pigment Orange 1	05	19.000
Pigment Orange 2	05	20.000
Pigment Orange 5	05	21.000
Pigment Orange 13	05	23.000
Pigment Orange 15	05	24.000
Pigment Orange 16	05	25.000
Pigment Orange 17	05	206.000
Pigment Orange 34	05	25.180
Pigment Orange 43	05	25.270
Pigment Orange 46	05	26.046
Pigment orange toners, all other	05	29.000
Pigment Red 1, (light)	05	48.000
Pigment Red 2	05	30.000
Pigment Red 3	05	49.000
Pigment Red 4	05	50.000
Pigment Red 5	05	31.000
Pigment Red 6	05	51.000
Pigment Red 13	05	36.000
Pigment Red 14	05	37.000

Chemical name	Sect. No.	Item No.
Pigment Red 17	05	39.000
Pigment Red 21	05	40.021
Pigment Red 22	05	43.000
Pigment Red 23	05	44.000
Pigment Red 31	05	45.000
Pigment Red 38	05	52.000
Pigment Red 41	05	54.000
Pigment Red 48	05	55.000
Pigment Red 48:1, (barium)	05	55.100
Pigment Red 48:2, (calcium)	05	55.200
Pigment Red 48:3, (strontium)	05	55.300
Pigment Red 48:4, (manganese)	05	55.400
Pigment Red 49:1, (barium)	05	57.000
Pigment Red 49:2, (calcium)	05	58.000
Pigment Red 52:1, (calcium)	05	61.000
Pigment Red 52:2, (manganese)	05	62.000
Pigment Red 53, (sodium)	05	63.000
Pigment Red 53:1, (barium)	05	64.000
Pigment Red 57	05	67.057
Pigment Red 57:1, (calcium)	05	68.000
Pigment Red 60:1	05	209.000
Pigment Red 63	05	70.000
Pigment red 66	05	45.066
Pigment Red 81, (PMA)	05	74.000
Pigment Red 81, (PTA)	05	75.000
Pigment Red 83	05	211.000
Pigment Red 88	05	78.000
Pigment Red 101	05	79.101
Pigment Red 112	05	45.810
Pigment Red 122	05	79.320
Pigment Red 123	05	80.000
Pigment Red 146	05	45.846
Pigment Red 147	05	45.847
Pigment Red 168	05	80.550
Pigment Red 169	05	80.555
Pigment Red 170	05	45.870
Pigment Red 179	05	80.660
Pigment Red 188	05	80.688
Pigment Red 190	05	80.770
Pigment Red 200	05	84.200
Pigment Red 202	05	84.202
Pigment Red 209	05	84.209
Pigment red 210	05	84.210
Pigment Red 224	05	84.224
Pigment Red 245	05	84.245
Pigment Red 63:1, calcium	05	70.001
Pigment red toners, all other	05	86.000
Pigment Violet 1, (fugitive)	05	87.000
Pigment Violet 1, (PMA)	05	88.000
Pigment Violet 1, (PTA)	05	89.000
Pigment Violet 3, (fugitive)	05	90.000
Pigment Violet 3, (PMA)	05	91.000
Pigment Violet 3, (PTA)	05	92.000
Pigment Violet 4, (fugitive)	05	92.004
Pigment Violet 19	05	93.160

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
Pigment Violet 23	05	93.200
Pigment Violet 29	05	93.229
Pigment Violet 39, (PMA)	05	93.439
Pigment violet toners, all other	05	98.000
Pigment Yellow 1	05	1.000
Pigment Yellow 2	05	1.500
Pigment Yellow 3	05	2.000
Pigment Yellow 12	05	8.000
Pigment Yellow 13	05	9.000
Pigment Yellow 14	05	10.000
Pigment Yellow 17	05	11.000
Pigment Yellow 42	05	6.372
Pigment Yellow 60	05	6.460
Pigment Yellow 65	05	6.465
Pigment Yellow 73	05	6.620
Pigment Yellow 74	05	6.630
Pigment Yellow 83	05	11.660
Pigment Yellow 97	05	6.697
Pigment Yellow 98	05	6.698
Pigment Yellow 110	05	14.810
Pigment Yellow 139	05	14.839
Pigment Yellow 152	05	11.752
Pigment yellow toners, all other	05	18.000
Pinane	15	136.200
Pinane hydroperoxide	15	136.500
2-Pinanol (cis and trans)	15	136.800
α-Pinene	15	137.000
β-Pinene	15	138.000
α-Pinene epoxide	15	139.000
α-Pinene oxide	15	139.500
Pinene, sulfate	15	140.000
Pinene, wood	15	141.000
Pine oil, natural sulfate	15	141.195
Pine oil, synthetic	15	141.200
Pine oil,synthetic	15	1412.000
Piperacillin	06	19.200
Piperazine	06	123.000
Piperazine dihydrochloride	06	125.000
Piperazine hexahydrate	06	126.000
Piperazine hydrochloride	06	127.000
Piperazine sulfate	06	129.000
Piperidine	03	1365.000
Piperonal (Heliotropin)	07	80.000
Piperylene (1,3-Pentadiene)	02	58.600
Piroxicam	06	412.500
Pitch of tar, all other	01	30.000
Pitch of tar: hard (M.P. 161 F° and Over)	01	28.000
Pitch of tar: medium (M.P. 110° To 160° F)	01	27.000
Pitch of tar: soft (M.P. 80° To 109° F.)	01	26.000
Pivaloyl chloride	15	569.000
2-Pivaloyl-1,3-indandione (Pindone)	13	170.000
Plant growth regulators, acyclic, all other	13	231.590
Plastics alloys or blends	08	25.200
Plinyl acetate	07	115.290
Polyacrylamide	14	403.000
Polyacrylamide copolymers, all other	14	405.500
Polyacrylate methacrylate copolymers	14	427.000
Polyacrylate poly(hydroxypropylacrylate) copolymer	14	428.000
Polyacrylic acid	15	570.000
Polyacrylic acid	14	430.000
Poly(acrylic acid, ethyl ester)	14	423.000
Poly(acrylic acid, methyl ester/ethylene/ 1,1 dichlorosuccinic acid, methylene-) with ethyl acrylate	14	425.000
Polyacrylic acid salts, all other	14	434.000
Polyacrylic (ACM) type elastomers	10	13.000
Polyacrylonitrile and acrylonitrile copolymers	14	391.000
Polyacrylonitrile, hydrolyzed	14	435.000
Polyacrylonitrile, starch hydrolized polymer	14	436.000
Poly-4-(2-acryloxyethoxy)-2-hydroxybenzophenone	15	144.000
Polyalicyclene polyamines and salts and quats	12	417.500
Polyalkalene oxide	10	13.200
Polyalkylene glycol oleate	12	719.050
Polyamine polymethane phosphonic acid	14	87.000
Polyamine polymethane phosphonic acid, magnesium salt	14	88.000
Polyamines	14	437.000
Polyamine/tall oil imidazoline	12	413.400
Polybasic acid type alkyd resins	08	3.000
Polybutadiene acrylic acid acrylonitrile terpolymer (PBAN)	10	13.300
Polybutadiene, emulsion-polymerized	10	14.000
Polybutadiene resins	08	10.000
Polybutadiene, solution-polymerized	10	15.000
Polybutene	02	86.000
Polybutylene terephthalate(PBT)	08	30.020
Polybutylene type resins	08	28.000
Polybutylether carbamate	14	169.000
Polycarbonate resins	08	29.000
Polycarboxylic acid, alkylate	12	719.200
Polycarboxylic acid, alkylphenoxyalkoxylate	12	719.210
Polychloroprene (Neoprene) (CR) type	10	17.000
Polydextrose	14	438.000
Poly(diallyldimethylammonium chloride	14	439.000
Poly(dimethylimino(2-hydroxytrimethylene)chloride)	14	170.000
Poly(epichlorhydrin)	12	762.400
Polyester resins, saturated, all other	08	30.050
Polyester resins, unsaturated	08	12.000
Polyether amine, ethoxylated	12	334.400
Polyether diols	12	762.730
Polyether and polyester polyols for urethanes	08	12.050
Polyether triols	12	762.750
Polyethoxylate/polypropoxylate dibenzyl ether	12	762.800
Polyethylbenzene (80 percent diethylbenzene)	03	1369.000
Polyethylene glycol	15	1181.000
Polyethylene glycol butyl ether, propoxylated	15	1181.080
Polyethylene glycol dibenzoate	11	52.000
Polyethylene glycol diester of coconut oil acids	12	684.290
Polyethylene glycol diester of coconut oil and oleic acids	12	684.300
Polyethylene glycol diester of mixed liner acid/oleic acid	12	684.400

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
Polyethylene glycol diester of tall oil acids	12	684.500
Polyethylene glycol dilaurate	12	674.000
Polyethylene glycol dimethacrylate	15	1132.000
Polyethylene glycol dimethyl ether	15	1181.200
Polyethylene glycol dioleate	12	675.000
Polyethylene glycol distearate	12	676.000
Polyethylene glycol ester of mixed fatty acids	12	684.700
Polyethylene glycol esters of chemically defined acids, all other	12	684.000
Polyethylene glycol esters of mixed acids, all other	12	691.000
Polyethylene glycol hydroxyacetate	12	676.500
Polyethylene glycol monocaprylate	12	677.500
Polyethylene glycol monoester of coconut oil acids	12	685.510
Polyethylene glycol monoester of soybean oil acids	12	685.000
Polyethylene glycol monoester of tall oil acids	12	685.700
Polyethylene glycol monoisostearate	12	677.600
Polyethylene glycol monolaurate	12	678.000
Polyethylene glycol mono(nonylphenol)ether ammonium sulfate	12	762.970
Polyethylene glycol mono-oleate	12	679.000
Polyethylene glycol mono-oleate, ethoxylated	12	679.100
Polyethylene glycol monopalmitate	12	680.000
Polyethylene glycol monopelangonate, methoxylated	12	680.250
Polyethylene glycol monopelargonate	12	680.200
Polyethylene glycol monoricinoleate	12	681.000
Polyethylene glycol monostearate	12	682.000
Polyethylene glycol monotallate	12	682.250
Polyethylene glycol sesquiester of coconut oil acids	12	687.000
Polyethylene glycol sesquiester of tall oil acids	12	689.000
Polyethylene glycol sesquiester of tallow acids	12	690.000
Polyethylene glycol sesquinoleate	12	683.000
Polyethylene glycol terephthalate	12	683.200
Polyethyleneimine	14	442.000
Polyethyleneimine methyl ammonium sulfate	12	477.250
Polyethylenepolyamine, alkoxylated	12	334.000
Polyethylenepolyamine polymer with 1,4-dihyroxy -2-butyne	14	171.000
Polyethylene terephthalate	14	390.000
Polyethylene terephthalate (PET)	08	30.040
Polyglycerol decaoleate	12	692.200
Polyglycerol distearate	12	692.500
Polyglycerol esters, all other	12	698.000
Polyglycerol mono-oleate	12	696.000
Polyglycerol monostearate	12	697.000
Polyglycerol tetraoleate	12	697.450
Polyglycols, ethylene glycol and glycol ether, mixed	15	1184.000
Polyglycols-toluene diisocyanate reaction product	15	144.600
Polyhexafluoropropylene oxide	15	1411.200
Polyhydric alcohol esters, all other	15	1141.000
Polyhydric alcohol ethers, all other	15	1196.000
Polyhydric alcohol, ethoxylated and phosphated	12	88.800
Polyhydric alcohols, all other	15	1096.000
Polyimides and amide-imide polymers	08	34.000
Polyimine, propoxylated	12	334.500
Polyisobutenyl succinic anhydride	14	288.000
Polyisoprene (IR) type	10	19.000
Polyisopropenylphosphinic acid	15	571.400
Polymeric phosphites	09	85.500
Polymerization regulators, acyclic, other	09	173.000
Polymers for fibers, all other	14	394.000
Polymers, water soluble, all other	14	452.000
Polymethacrylic acid esters	15	1411.300
Polymethacrylic acid, sodium salt	14	445.000
Polymethylene polyphenylisocyanate	03	1023.000
Poly(1,1'-(methylimino)bis(3-chloro-2-propanol) teetramethylethylenediamine	14	446.000
Polymethyl methacrylate (PMMA)	08	20.040
Polymethylvinyl ether monoethylmaleate	15	1181.600
Poly(mixed ethylene, propylene)glycol	12	763.000
Polymyxin B	06	56.000
Poly-α-olefins	14	453.000
Poly-α -olefins, sulfurized	14	454.000
Polyol glycidyl ether	15	1317.700
Polyoxyalkene silicones	15	1391.000
Polyoxyalkylated cyclic amines	14	468.000
Polyoxyalkylate(fatty alcohol), phosphate ester	12	112.650
Polyoxyalkylene glycol	15	1181.800
Poly(oxy-1,2-ethanediyl), w-(2-carboxyethoxy)-ω' -hydroxy-α, α'-(iminodi-2, 1-ethanediyl) bis-, N-tallow alkyl derivs, potassium salt	12	47.490
Poly(oxy-1,2 ethanediyl) αcarboxy-methyl,	12	47.500
Poly(oxy-1,2-ethanediyl)-α -carboxymethyl, omega-(tridecyloxy), potassium salt	06	457.000
Poly)oxy-1,2-ethanediyl), α-hydro-w-hydroxy (C_2H_4O) nH_2O)	15	1181.900
Poly(oxy-1,2-ethanediyl), α-phenylmethyl-70-hydroxy,C_{12} C_{15} alkyl ethers	12	763.450
Poly(oxy-1,2-ethanediyl), α-phenylmethyl-70-hydroxy, ethoxylated nonylphenol alkyl ether	12	763.500
Poly [oxyethylene(dimethylimino)ethylene(dimethylimino) ethylene dichloride]	13	195.013
Poly(oxypropylene)diamine	15	297.720
Polyoxypropylene polyoxyethylene glycol, mixed	15	1185.000
Polyphenolic phosphites, polyalkylated	09	86.000
Polyphenyl aromatic ester resins	08	34.500
Poly-m-phenylene isophthalamide	14	392.000
Polyphenylene oxide type resins	08	35.000
Polyphenylene sulfide resins	08	35.500
Poly-p-phenylene terephthalamide	14	393.000
Polypropoxybutyl ether	15	1182.000
Poly(propoxy)butyl ether, ethoxylated	15	1182.005
Polypropoxy diethylmethyl ammonium chloride	12	465.650
Polypropylene glycol	15	1186.000
Polypropylene glycol, alkoxylated, polymer with maleic anhydride, acrylic acid, and alkylphenol-formaldehyde resin, alkoxylated	12	764.400
Polypropylene glycol dioleate	12	719.400
Polypropylene glycol, ethoxylated	12	764.000
Polypropylene glycol, ethoxylated, adipic acid ester	12	719.405

Table D-1—Continued
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Chemical name	Sect. No.	Item No.
Polypropylene glycol glycerol tri-ether	15	1186.500
Polypropylene glycol glycerol triether, copolymer with epichlorhydin bisphenol epoxy resin	12	764.110
Polypropylene polymer and copolymer resins	08	36.000
Polysulfide (T) type elastomers	10	20.000
Polyterpene resins	08	38.000
Polytetrafluoroethylene (PTFE)	08	38.100
Polytetrafluoroethylene ethyl iodide	15	1269.000
Polytetramethylene glycol ether	15	1187.000
Polythiazide	06	725.000
Polyurethane elastomers	08	13.040
Polyurethane resins	08	13.080
Polyvinyl acetate resins	08	47.000
Polyvinyl alcohol resins	08	48.000
Polyvinyl butyral resins	08	49.000
Polyvinyl chloride copolymer resins, all other	08	49.020
Polyvinyl chloride homopolymer resins	08	49.010
Polyvinyl formal resin	08	49.050
Polyvinylidene fluoride resin	08	38.150
Poly(vinyl-O-sulfobenzal)	14	379.000
Potassium acetate	15	602.000
Potassium aminobenzoate	06	395.000
Potassium benzoate	15	10.800
Potassium citrate	15	625.000
Potassium dihexyl phosphorodithioate	15	730.500
Potassium 2-ethylhexanoate	15	641.000
Potassium formate	15	653.000
Potassium gluconate	06	766.000
Potassium glutamate	14	9.000
Potassium 2-methyl-2-butanol	15	1411.400
Potassium 2-methyl-2-propanol	15	1411.600
Potassium oxalate	15	725.000
Potassium salicylate	06	387.000
Potassium and sodium salts of fatty, rosin, and tall oil acids, all other	12	74.000
Potassium sodium tartrate	15	768.000
Potassium stearate	15	761.500
Potassium warfarin	06	629.000
Povidone - iodine	06	271.000
Pramoxine hydrochloride	06	710.000
Prazepam	06	508.000
Prazosin hydrochloride	06	359.700
Prednisolone	06	664.000
Prednisolone acetate	06	665.000
Prednisone	06	666.000
Primary monoamines, all other	12	430.000
Priming and refractory oil	01	21.040
Probenecid	06	740.000
Probucol	06	616.000
Procainamide hydrochloride	06	380.000
Procarbazine hydrochloride	06	279.400
Progesterone	06	683.000
Progestins, all other	06	684.000
1-Propanamine, 3-(C_{12}-C_{15} alkoxy derivatives)	12	413.500
1-Propanaminium, N-ethyl-N,N-dimethyl-3-[(1-oxooctadecyl)amino]-, ethyl sulfate	12	477.280
1,3-Propanediamine, alkoxylated	12	334.620
1,2-Propanediol dioctanoate/decanoate	12	699.080
1,2-Propanediol dipelargonate	12	699.140
1,2-Propanediol distearate	12	699.000
Propanediol esters, all other	12	704.000
1,2-Propanediol d1-2-ethyl mexanoate	12	698.900
1,2-Propanediol monolaurate	12	701.000
1,2-Propanediol mono-oleate	12	702.000
1,2-Propanediol monostearate	12	703.000
3 Propanoic acid, cocoamino, sodium salt	12	31.500
4-Propanolpyridine	03	485.500
Propantheline bromide	06	293.000
p-Propenylanisole (Anethole)	07	81.000
Propionaldehyde	15	802.000
Propionic acid	15	572.000
Propionic acid salts, all other	15	739.000
Propionic anhydride	15	573.000
Propionic blends	15	1460.000
Propionitrile	15	450.500
Propionyl chloride	15	573.050
Propiophenone	03	1374.000
Propoxyethanol (Ethylene glycol monopropyl ether)	15	1187.750
Propoxylated starches	14	496.000
Propoxyphene hydrochloride	06	413.000
Propoxyphene napsylate	06	414.000
Propranolol hydrochloride	06	381.500
Propyl acetate	15	1050.000
Propyl alcohol (Propanol)	15	868.000
Propylamine, mono-	15	301.000
p-Propylanisol (Dihydroanethole)	07	81.200
S-Propyl butylethylthiocarbamate (Pebulate)	13	206.000
Propyl chlorothioformate	15	1050.400
S-Propyl dipropylthiocarbamate (Vernolate)	13	207.000
Propylene	02	42.000
Propylene carbonate	15	1051.000
Propylene glycol (1,2-Propanediol)	15	1093.000
Propylene glycol, alkoxylated	15	1187.900
Propylene glycol t-butyl ether	15	1187.920
Propylene glycol dibenzoate	15	147.800
Propylene glycol esters of hydrogenated palm oil	12	719.500
Propylene glycol monohydroxy stearate	12	719.540
Propylene glycol sebacate	11	115.500
Propylene oxide	15	1323.000
Propyl furylacrylate	07	115.400
Propyl gallate	15	148.000
Propylhexedrine	06	344.000
n-Propyl mercaptan (1-Propanethiol)	02	96.000
n-Propyl oleate	11	95.000
Propyl oleate, sulfated, sodium salt	12	262.000
2-Propyn-1-ol (Propargyl alcohol)	15	869.000
Protease (bacterial)	14	104.000
Proteases, all other	14	108.000
Protein hydrosylates	14	17.000
Protriptyline hydrochloride	06	533.000
Pseudoephedrine hydrochloride	06	346.000
Pseudoephedrine sulfate	06	347.000

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
Pseudoionone	15	836.000
Pseudo linalyl acetate (Neobergamate)	07	166.700
Pyrantel pamoate	06	129.300
8,16-Pyranthrenedione	03	1376.000
1,3,6,8-Pyrenetetrasulfonic acid	03	1377.200
2-Pyridinecarboxaldehyde	03	1379.500
Pyridine hydrochloride	03	1382.000
3-Pyridinemethanol	03	1383.000
2° Pyridine, refined	03	1378.000
Pyridine, refined all other grades	03	1379.000
2 Pyridinethiol-1-oxide, sodium salt	03	1380.003
2 Pyridinethiol-1-oxide, zinc salt	03	1380.053
Pyridostigmine bromide	06	319.000
4-Pyridylacetone	03	1383.100
Pyrilamine maleate	06	105.000
Pyrilamine tannate	06	107.000
2,4(1H,3H)Pyrimidinedione	15	148.990
Pyrogallol	03	1387.500
Pyromellitic dianhydride	03	1392.000
2-Pyrrolidinone (2-Pyrrolidone)	03	1391.000
2-Pyrrolidone-1-ethyl polymer with 1-eicosene	15	150.000
4-N-(1-Pyrrolidyl)-m-toluenediazonium chloride	14	380.000
Pyrvinium pamoate	03	797.200
Quaternary ammonium salts having amide linkages, all other	12	479.000
Quaternary ammonium salts, not containing oxygen, acyclic, all other	12	507.000
Quaternary ammonium salts not containing oxygen, cyclic, all other	12	528.000
Quinoline-2,3-dicarboxylic acid	03	1395.500
Quinoline, other grades	03	1395.000
8-Quinolinol	03	1397.000
8-Quinolinol, copper salt	13	30.000
8-Quinolinol, magnesium salt	13	30.200
8-Quinolinol, sulfate salt	13	30.300
p-Quinone	15	14.000
Rapeseed acids (ratio=1/1)	12	549.200
Rare earths 2-ethylhexanoate	15	642.000
Rare earths naphthenate	14	312.000
Rare earths neodecanoate	15	709.750
Reactive Black 5	04	952.000
Reactive Black 9	04	953.000
Reactive black dyes, all other	04	954.000
Reactive Blue 3	04	939.000
Reactive Blue 4	04	940.000
Reactive Blue 5	04	941.000
Reactive Blue 13	04	942.013
Reactive Blue 19	04	943.000
Reactive Blue 21	04	944.000
Reactive Blue 38	04	946.000
Reactive Blue 41	04	946.041
Reactive Blue 71	04	946.071
Reactive Blue 79	04	946.079
Reactive Blue 89	04	946.089
Reactive Blue 173	04	946.173
Reactive Blue 174	04	946.174
Reactive Blue 199	04	946.199
Reactive Blue 203	04	946.203
Reactive blue dyes, all other	04	947.000
Reactive Brown 1	04	949.000
Reactive Brown 17	04	949.017
Reactive Brown 18	04	949.018
Reactive Green 19	04	948.019
Reactive Orange 1	04	912.000
Reactive Orange 4	04	913.000
Reactive Orange 12	04	914.000
Reactive Orange 13	04	915.000
Reactive Orange 14	04	916.000
Reactive Orange 16	04	917.000
Reactive Orange 20	04	917.020
Reactive Orange 78	04	917.078
Reactive Orange 84	04	917.084
Reactive Orange 86	04	917.086
Reactive orange dyes, all other	04	918.000
Reactive Red 2	04	920.000
Reactive Red 8	04	923.000
Reactive Red 11	04	924.000
Reactive Red 21	04	925.000
Reactive Red 29	04	926.000
Reactive Red 31	04	927.000
Reactive Red 33	04	928.000
Reactive Red 43	04	930.043
Reactive Red 49	04	930.049
Reactive Red 94	04	931.094
Reactive Red 120	04	931.120
Reactive Red 141	04	931.141
Reactive Red 147	04	931.147
Reactive Red 180	04	931.180
Reactive red dyes, all other	04	932.000
Reactive Violet 1	04	933.000
Reactive Violet 5	04	936.000
Reactive violet dyes, all other	04	937.000
Reactive Yellow 7	04	904.000
Reactive Yellow 15	04	905.000
Reactive Yellow 17	04	906.000
Reactive Yellow 18	04	907.000
Reactive Yellow 22	04	907.022
Reactive Yellow 37	04	910.000
Reactive Yellow 42	04	910.042
Reactive Yellow 86	04	910.086
Reactive Yellow 125	04	910.125
Reactive Yellow 133	04	910.133
Reactive Yellow 135	04	910.135
Reactive Yellow 160	04	910.160
Reactive yellow dyes, all other	04	911.000
Realtive Red 35	04	928.035
Rennin	14	106.000
Resorcinol	06	272.000
Resorcinol diglycidyl ether	15	151.500
Resorcinol, dimethyl ether	03	1399.500
Resorcinol monobenzoate	15	151.000
Resorcinol, tech,	03	1399.000

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
β-Resorcylic acid, lead salt	03	1403.000
Rhodinol	07	167.000
Riboflavin (animal feed grade)	06	801.000
Riboflavin (medicinal grade)	06	802.000
Riboflavin-5-phosphate, sodium	06	803.000
Ricinoleic and acetylricinoleic acid esters, all other	11	111.000
Ricinoleic acid	12	564.950
Ricinoleic acid salts, all other	15	742.000
Rimantidine hydrochloride	06	188.600
Rose oxide	07	115.500
Rosin acid salts, all other	15	160.000
Rosin acids, potassium salt	12	65.000
Rosin acids, sodium salt	12	66.000
Rosin acids, triethanolamine salt	12	32.000
Rosin amine, ethoxylated	12	355.000
Rosin amines	14	136.000
Rosin esters, unmodified (Ester gums)	08	39.000
Roxarsone	06	159.000
Roxarsone, sodium	06	160.000
Rubber modified polystyrene	08	44.020
Rubber-processing chemicals, cyclic, all other	09	127.000
Rust preventing additives	14	172.000
Saccharin (1,2-Benzisothiazolin-3-one,-1,1-dioxide)	07	85.000
Saccharin,sodium salt	07	87.000
Salicylaldehyde	03	1404.000
Salicylaldehyde oxime	03	1404.502
Salicylanilide	03	1405.000
Salicylic acid	06	557.000
Salicylic acid, ammonium salt	15	161.500
Salicylic acid magnesium salt	15	162.200
Salicylic acid, tech.	03	1406.000
Salsalate	06	389.000
Salts of organic acids, all other	15	781.000
α-Santalyl acetate	07	116.100
Sarcosine	14	18.000
Sebacic acid	15	574.000
Sebacoyl chloride	15	575.000
Secobarbital	06	460.000
Secobarbital, sodium	06	461.000
Secondary and tertiary monoamines, all other	12	447.000
Semicarbazide hydrochloride	15	473.000
Semisynthetic penicillins, all other	06	20.000
Silicone fluids	15	1392.000
Silicone greases	14	462.000
Silicone resins	08	14.000
Silicone (Q) type elastomers	10	21.000
Simvastatin	06	328.500
Sisomycin	06	56.700
Skeletal muscle relaxants, all other	06	482.000
Sodium acetate	15	603.000
Sodium aminobenzoate	06	396.000
Sodium aminosalicylate	06	148.000
Sodium ammonium polyacrylate and copolymers	14	431.000
Sodium ascorbate	06	809.000
Sodium benzoate, U.S.P.	15	12.000
Sodium benzoate, tech.	15	11.000
Sodium bitartrate	15	769.000
Sodium n-butylxanthate	14	142.000
Sodium caprylate	06	137.000
1-(Sodium carboxyethylene)-1-(sodium carboxymethyleneoxyethylene)-2-nor-(tall oil fatty acids) -2-imidazolinium hydroxide	12	27.100
Sodium carboxymethyl amylose	14	432.000
Sodium carboxymethylcellulose (100%)	14	412.000
1-(Sodium carboxymethyl)-1-(sodium carboxymethyleneoxyethylene)-2-nor-(coconut oil fatty acids)-2-imidazolinium lauryl sulfate	12	27.200
Sodium carboxymethyl starch	14	432.200
Sodium citrate	15	626.000
Sodium cresylate	01	18.050
Sodium diacetate	15	604.000
Sodium di-sec-butyl/diethyl phosphorodithioate	15	731.000
Sodium di-sec-butyl phosphorodithioate	15	732.000
Sodium diethyl phosphorodithioate	15	733.000
Sodium dihexyl phosphorodithioate	15	734.000
Sodium dihydrobis(2-methoxyethoxy)aluminum hydride	15	1363.900
Sodium diisobutyl phosphorodithioate	15	734.500
Sodium diisopropyl phosphorodithioate	15	735.000
Sodium 2-ethylhexanoate	15	642.500
Sodium ethylxanthate	14	144.000
Sodium fluoroacetate	13	232.000
Sodium formate, technical	15	655.000
Sodium gluconate	15	662.000
Sodium heparin	06	630.000
Sodium lactate (Nalac)	15	674.000
Sodium mercaptoacetate	15	697.000
Sodium methoxide (Sodium methylate)	15	1418.000
Sodium-N-methyl-N-oleyl taurate	15	743.550
Sodium nitroprusside	06	359.800
Sodium oleate	15	719.500
Sodium oxalate	15	726.000
Sodium polyacrylate	14	433.000
Sodium propionate	15	738.000
Sodium salicylate	06	390.000
Sodium stearate	15	762.100
Sodium p-sulfophenylmethallyl ether	03	1410.100
Sodium d1-2-sulfosuccinate	15	742.900
Sodium trichlorobenzenesulfate	03	1410.500
Solid type polyvinylidene chloride resins	08	50.020
Solubilized Sulfur Black 1	04	1108.000
Solubilized Sulfur Black 2	04	1111.000
Solvent Black 5	04	1052.000
Solvent Black 7	04	1053.000
Solvent Black 13	04	1055.000
Solvent Black 26	04	1057.000
Solvent Black 46	04	1057.046
Solvent Black 47	04	1057.047
Solvent Black 49	04	1057.049
Solvent Blue 3	04	1020.000
Solvent Blue 4	04	1021.000
Solvent Blue 5	04	1022.000
Solvent Blue 35	04	1028.035

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
Solvent Blue 36	04	1029.000
Solvent Blue 38	04	1031.000
Solvent Blue 58	04	1033.000
Solvent Blue 59	04	1034.000
Solvent Blue 60	04	1035.000
Solvent Blue 98	04	1037.000
Solvent Blue 99	04	1037.099
Solvent Blue 100	04	1038.000
Solvent Blue 101	04	1038.101
Solvent Blue 102	04	1038.102
Solvent Blue 128	04	1038.128
Solvent Blue 129	04	1038.129
Solvent blue dyes, all other	04	1039.000
Solvent Brown 12	04	1045.000
Solvent Brown 20	04	1047.000
Solvent Brown 22	04	1048.000
Solvent Brown 38	04	1049.000
Solvent Brown 52	04	1049.052
Solvent Green 3	04	1042.000
Solvent Orange 2	04	977.000
Solvent Orange 3	04	978.000
Solvent Orange 7	04	980.000
Solvent Orange 20	04	981.000
Solvent Orange 23	04	982.000
Solvent Orange 25	04	984.000
Solvent Orange 31	04	985.000
Solvent Orange 60	04	987.060
Solvent Orange 77	04	987.077
Solvent Orange 97	04	987.097
Solvent orange dyes, all other	04	988.000
Solvent Red 1	04	989.000
Solvent Red 23	04	991.023
Solvent Red 24	04	992.000
Solvent Red 26	04	993.000
Solvent Red 27	04	994.000
Solvent Red 42	04	995.042
Solvent Red 49	04	999.000
Solvent Red 68	04	1001.000
Solvent Red 74	04	1003.000
Solvent Red 111	04	1008.000
Solvent Red 164	04	1011.000
Solvent Red 166	04	1012.000
Solvent Red 168	04	1012.168
Solvent Red 169	04	1012.169
Solvent Red 172	04	1012.172
Solvent Red 175	04	1012.175
Solvent Red 207	04	1012.207
Solvent Red 208	04	1012.208
Solvent Red 222	04	1012.222
Solvent red dyes, all other	04	1013.000
Solvent Violet 8	04	1014.000
Solvent Violet 9	04	1015.000
Solvent Violet 13	04	1016.000
Solvent Violet 14	04	1017.000
Solvent Violet 38	04	1018.038
Solvent violet dyes, all other	04	1019.000

Chemical name	Sect. No.	Item No.
Solvent Yellow 3	04	957.000
Solvent Yellow 13	04	958.000
Solvent Yellow 14	04	959.000
Solvent Yellow 16	04	959.016
Solvent Yellow 18	04	959.018
Solvent Yellow 33	04	963.000
Solvent Yellow 40	04	965.000
Solvent Yellow 42	04	966.000
Solvent Yellow 43	04	967.000
Solvent Yellow 56	04	971.000
Solvent Yellow 72	04	973.000
Solvent Yellow 94	04	974.094
Solvent Yellow 107	04	975.000
Solvent Yellow 131	04	975.131
Solvent Yellow 135	04	975.135
Solvent Yellow 143	04	975.143
Solvent Yellow 160	04	975.160
Solvent Yellow 161	04	975.161
Solvent yellow dyes, all other	04	976.000
Sorbitol (70% by Weight)	15	1094.000
Sorbitol, alkoxylated	15	1188.900
Sorbitol, ethoxylated	15	1189.000
Sorbitol monooleate	15	1189.300
Sorbitol monostearate	15	1190.300
Sorbitol, propoxylated	15	1190.000
Soya fatty acids, reaction products with chloromethame and diethylenetriamine, ethoxylated, quaternized	12	477.350
Soya fatty acids, reaction products with chloromethane and diethylenetriamine, propoxylated, quaternized	12	477.360
Soya sterols, ethoxylated	12	754.700
Soybean oil acids (Ratio=1/1)	12	549.300
Soybean oil acids, potassium salt	12	67.000
(Soybean oil alkyl)amine	12	427.000
(Soybean oil alkyl)amine, ethoxylated	12	335.000
N-(Soybean oil alkyl)trimethylenediamine	12	414.000
Soybean oil, sulfated, sodium salt	12	312.000
Specific gravity 0.940 and below	08	31.100
Specific gravity 0.940 and below	08	31.400
Specific gravity over 0.940	08	32.000
Spectinomycin (animal feed grade)	06	75.000
Spectinomycin (medicinal grade)	06	57.000
Spiro [3H-1,2-benzoxathiole-3,9'-[9H]-xanthene]-3',6' - diol-1,1-dioxide	03	1410.600
Spironolactone	06	740.500
Stannous 2-ethylhexanoate	15	643.000
Stannous octyl phthallate	15	164.300
Stearamide (Octadecane amide)	15	253.000
Stearamidoethyldiethylamine	12	388.900
Stearamidoethylethanolamine acetate	12	388.950
Stearamidoethyl-2-heptadecyl imidazoline	12	414.500
Stearamidopropyldimethylceterylammonium tosylate and propylene glycol	12	477.390
Stearic acid (Ratio = 2/1)	12	542.000
Stearic acid (Ratio = 1/1)	12	565.000
Stearic acid (Ratio = 2/1)	12	562.000
Stearic acid (Ratio = 1/1)	12	550.000

Table D-1—Continued
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Chemical name	Sect. No.	Item No.
Stearic acid aminoethanolamine (amine acid ratio = 1.0/1.65)	12	575.450
Stearic acid-aminoethyl ethanolamine (amine/acid ratio = 1.75/1.0)	12	575.500
Stearic acid aminoethylethanolamine (amine acid ratio = 1/2)	12	575.505
Stearic acid-N-aminoethyl ethanolamine condensate	12	581.200
Stearic acid, ammonium salt	12	67.990
Stearic acid, diethanolamine condensate, methyl sulfate	12	389.500
Stearic acid-diethylenetriamine condensate	12	367.000
Stearic acid-diethylenetriamine condensate, ethyl sulfate	12	367.500
Stearic acid-N,N-diethylethylenediamine condensate	12	368.000
Stearic acid esters, all other	11	125.000
Stearic acid - ethylenediamine condensate	12	368.290
Stearic acid-ethylenediamine condensate amine/acid ratio = 1/2	12	586.000
Stearic acid-ethylenediamine condensate, monoethoxylated	12	382.000
Stearic acid-ethylenediamine condensate, polyethoxylated	12	383.000
Stearic acid ethylene diamine methyl ammonium sulfate	12	501.500
Stearic acid mixed amine condensate	12	369.500
Stearic acid monoethanolamine condensate	12	581.500
Stearic acid, potassium salt	12	68.000
Stearic acid, sodium salt	12	69.000
Stearic acid-tetraethylenepentamine condensate	12	370.000
Stearic acid,N,N,N',N'-tetrakis(2-hydroxyethyl)-ethylenediamine salt	12	33.000
Stearic acid, triethanolamine salt	12	34.000
Stearonitrile (Octadecane nitrile)	15	451.000
N-Stearoyl-p-aminophenol	09	104.000
Stearyl acid phosphate	15	1035.300
Stearyl alcohol, propoxylated	12	733.310
Stearyl alcohol, propoxylated	12	738.700
Stearylamidopropyldimethyl amine	12	388.200
Stearylamidopropyl dimethylamine lactate	15	474.120
Stearylamidopropyl dimethyl myristyl acetate ammonium chloride	12	477.400
Stearyl amine polyphosphoric acid, ethoxylated	12	112.810
Stearylerucamide	15	254.000
Stearyl methacrylate	15	1053.000
Stearyl pyridium chloride	12	501.550
Stearyl stearamide	15	254.200
Stearyl stearate	15	979.600
Straight polystyrene	08	44.030
Streptomycin	06	76.000
Streptozocin	06	279.500
Strontium naphthenate	14	313.000
Strontium stearate	15	762.200
Styphnic acid, lead salt	15	164.800
Styphnic acid, magnesium salt	15	164.810
Styrenated-alkyds, or copolymer alkyds	08	3.500
Styrene (Vinylbenzene)	03	1411.000
Styrene-acrylonitrile copolymer resins (SAN)	08	43.000
Styrene-allyl alcohol copolymer resins	08	44.043
Styrene-butadiene, dry type	10	3.100
Styrene-butadiene latexes	08	44.060
Styrene-butadiene, latex type	10	3.500
Styrene-butadiene type elastomers, other	10	4.500
Styrene-butadiene-vinylpyridine	10	4.000
Styrene copolymers, all other	08	44.049
Styrene-divinylbenzene copolymer resins	08	44.044
Styrene latexes, all other	08	44.080
Styrene-maleic anhydride copolymer resins	08	44.045
Styrene-methyl methacrylate copolymer resins	08	44.047
Styrene oxide	15	165.000
Styrene type plastics materials,all other	08	45.500
Succinic anhydride	15	165.500
Succinylcholine chloride	06	480.000
Succinyl peroxide	15	1296.500
Sucralfate	06	621.500
Sucrose acetate isobutyrate	11	126.000
Sucrose benzoate	15	166.000
Sucrose, ethoxylated and propoxylated	12	720.100
Sucrose octa-acetate	15	1133.000
Sulfabenzamide	06	208.000
Sulfacetamide, sodium	06	212.000
Sulfadiazine	06	215.000
Sulfadiazine, silver	06	215.200
Sulfadimethoxine	06	217.000
Sulfaguanidine	03	1412.200
Sulfamethazine	06	221.000
Sulfamethazine, sodium	06	222.000
Sulfamethizole	06	223.000
Sulfamethoxazole	06	224.000
Sulfanitran	06	227.000
Sulfasalazine	06	232.000
Sulfated animal fats and oils, all other	12	297.000
Sulfated ethers, all other	12	283.000
Sulfated fish and marine fat oils, all other	12	304.000
Sulfathiazole, sodium	06	234.000
Sulfentanil citrate	06	414.600
Sulfisoxazole	06	235.000
Sulfisoxazole, acetyl	06	201.000
m-Sulfobenzoic acid, monosodium salt	03	1416.500
5-Sulfoisophthalic acid, 1,3-dimethyl ester	03	1417.000
5-Sulfoisophthalic acid, lithium salt	03	1417.300
5-Sulfoisophthalic acid, sodium salt	03	1417.500
Sulfonic acids, all other	12	215.000
Sulfonic acids having amide linkages, all other	12	189.000
Sulfonic acids with ether linkages, all other	12	209.000
4,4'-Sulfonyldiphenol (4,4'-Dihydroxydiphenyl sulfone)	03	1420.000
4-Sulfophthalic acid	03	1421.000
Sulfosalicylic acid	15	167.000
Sulfosuccinic acid, bis(diisobutyl)ester, amidodisodium salt	12	190.000
Sulfosuccinic acid, bis(2,6-dimethyl-4-heptyl)ester, sodium salt	12	191.000
Sulfosuccinic acid, bis(2-ethylhexyl)ester, sodium salt	12	192.000
Sulfosuccinic acid, dihexyl ester, sodium salt	12	194.000
Sulfosuccinic acid, diisobutyl ester, sodium salt	12	194.210
Sulfosuccinic acid, diisodecyl ester, sodium salt	12	194.200

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
Sulfosuccinic acid, diisooctyl ester, sodium salt	12	194.220
Sulfosuccinic acid, dioctyl ester, sodium salt	12	194.300
Sulfosuccinic acid, dipentyl ester, sodium salt	12	195.000
Sulfosuccinic acid, ditridecyl ester, sodium salt	12	196.000
Sulfosuccinic acid, (lauryl polyethylene glycol ether) ester, disodium salt	12	196.450
Sulfosuccinic acid esters, all other	12	197.000
Sulfosuccinic acid, (coconut oil alkyl)iminoisopropanol half-ester, sodium salt	12	193.400
Sulfosuccinic acid, lanolin ester, disodium salt	12	196.410
Sulfosuccinic acid, lauramidomonoethanolamine, disodium salt	12	196.440
Sulfosuccinic acid, monolaureth ester, disodium salt	12	196.495
Sulfosuccinic acid, monooleamidopolyethyleneglycol ester, disodium salt	12	196.515
Sulfosuccinic acid myristyl ester disodium monoethanolamine salt	12	196.580
Sulfosuccinic acid, oleamidopolyethyleneglycol, disodium salt	12	196.600
Sulfosuccinic acid, ricinoleamide monoethanolamine, disodium salt	12	196.800
Sulfoxone, sodium	06	149.000
Sulfur Black 11, 11:1	04	1114.000
Sulfur compounds, all other	14	264.000
Sulfuric acid esters, all other	12	317.000
Sulfurized corn oil	15	1330.050
Sulfurized lard oil	14	200.000
Sulfurized sperm oil substitutes	14	202.000
Sulfur orange dyes, all other	04	1067.000
Sulfur Red 10	04	1070.000
Sulfur yellow dyes, all other	04	1065.000
Sulindac	06	414.500
Sympathomimetic (adrenergic) agents, all other	06	349.000
Synthetic fatty alcohol ester, sulfated, sodium salt	12	302.500
Synthetic sweetner material,all other	07	88.000
Tall oil acids (Ratio = 2/1)	12	543.000
Tall oil acids	12	551.000
Tall Oil Acids	12	74.100
Tall oil acids/aminoethylpiperazine condensate	12	370.900
Tall oil acids, diethanolamine salt (Condensate)	12	34.300
Tall oil acids-diethylenetriamine condensate	12	371.000
Tall oil acids-dimethylamine condensate (Amine acid ratio = 1/1)	12	587.500
Tall oil acids, ethoxylated	12	672.400
Tall oil acids, ethoxylated and propoxylated	12	672.420
Tall oil acids, oxobottom ester, sulfated, sodium salt	12	268.650
Tall oil acids-polyalkylenepolyamine condensate	12	372.000
Tall oil acids-polyalkylene polyamine condensate, salts, with dodecylbenzene sulfonic acid and/or tall oil fatty acids	12	372.010
Tall oil acids, potassium salt	12	70.000
Tall oil acids, sodium salt	12	71.000
Tall oil acids, sulfated, sodium salt	12	268.700
Tall oil acids, triethanolamine salt	12	34.360
Tall oil acyl chloride	15	167.400
3-(Tall oil amino)propyl amine	12	414.600
Tall oil, chemically modified	15	168.000
Tall oil fatty acid-imidazoline, ethoxylated	12	767.500
Tall oil fatty acids (Ratio = 1/2)	12	555.300
Tall oil fatty acids (ratio = 2.7/1)	12	555.310
Tall oil fatty acids (ratio = 1.5/1)	12	555.305
Tall oil fatty acids, polymerized	15	167.600
Tall oil fatty acids-triethanolamine condensate	12	575.600
(Tall oil.fatty acids), triethanolamine salt	12	34.370
Tall oil monomer	15	168.050
Tall oil Pentaerythritol tallate	15	168.100
Tall oil, refined, ethoxylated	12	672.500
Tall oil salts, all other (Linoleic-rosin acid salts)	15	179.000
Tall oil,sulfated, ammonia salt	12	312.500
Tall oil, sulfated, sodium salt	12	312.700
Tallow acids (Ratio = 2/1)	12	544.000
Tallow acids	12	552.000
Tallow acids (amime/acid ratio=1.00/1.65)	12	567.450
Tallow acids, potassium salt	12	72.000
Tallow acids, sodium salt	12	73.000
Tallow acids, triethanolamine salt	12	34.500
Tallow alcohol, ethoxylated	12	740.000
(Tallow alkyl)amine	12	429.000
(Tallow alkyl)amine acetate	12	399.000
(Tallow alkyl)amine, ethoxylated	12	336.000
(Tallow alkyl)amine, ethoxylated, diethosulfate	12	465.940
(Tallow alkyl)-bis-(2-hydroxyethyl) methylammonium chloride	12	465.945
N-(Tallow alkyl)dipropylenetriamine	12	415.000
N-(Tallow alkyl)-3-iminodipropionic acid, disodium salt	12	18.000
N-(Tallow alkyl)trimethylenediamine	12	416.000
N-(Tallow alkyl)trimethylenediamine acetate	12	400.000
N-(Tallow alkyl)trimethylenediamine, ethoxylated	12	337.000
Tallow amide, hydrogenated	15	255.000
Tallow amine, ethoxylated, quarternary ammonium salt	12	477.700
Tallow, n- 3-(dimethylamino)propyl] (amine/ acid ratio=1/3)	12	587.600
[Tallow ethyl alkyl] amine, ethoxylated, sulfate	12	336.020
Tallow fatty acids-aminoethylethanolamine condensates	12	373.550
Tallow fatty acids, ethoxylated	12	672.600
Tallow nitrile	15	453.000
Tallow, sulfated, sodium salt	12	295.000
Tannic acid, N.F.	15	180.000
Tanning materials, synthetic, all other	14	471.000
Tar bases crude bases (Dry basis)	01	10.000
Tar distillates, all other	01	22.000
Tar for other uses crude	01	24.000
Tar for other uses refined	01	25.000
Tar, road	01	23.000
Tartaric acid salts, all other	15	770.000
Tepyl acetate	07	169.000
Terazosin	06	359.900
Terbutaline sulfate	06	347.500
Terephthalic acid	03	1422.000
Terephthalic acid, dimethyl ester	03	1424.000
Terephthaloyl chloride	03	1424.500
Terfenadine	06	109.000

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
Terpene hydrocarbons, monocyclic (Solvenol)	15	182.000
Terphenyl (Phenylbiphenyl) (m-,o-, and p-isomers)	03	1426.000
Terpinene-ol	07	116.500
Terpinene-4-ol	03	1426.500
α-Terpineol	07	117.000
α-Terpinyl acetate	07	120.000
α-Terpinyl propionate	07	121.000
1-Tert-butyl-2,5-dimethoxybenzene	03	377.500
Tertiary amyl per-2-ethylhexanoate	15	1283.200
Testosterone	06	641.800
Testosterone cypionate	06	642.000
Testosterone propionate	06	642.300
Tetrabromobisphenol A	15	184.000
1,1,2,2-Tetrabromoethane (Acetylene tetrabromide)	15	1214.000
Tetrabromophthalic anhydride	03	1429.000
Tetrabutylammonium bromide	12	501.600
Tetra Butyl ammonium hydrogen sulfate	12	477.850
Tetrabutyl titanate	15	1060.000
Tetracaine hydrochloride	06	715.100
2,4,5,6-Tetrachloroisophthalonitrile	13	31.200
Tetrachlorophthalic anhydride	03	1435.600
Tetracycline	06	37.000
1-Tetradecanaminium,N,N,N-trimethyl-chloride	12	501.604
n-Tetradecane	15	1348.500
1-Tetradecanol (Myristyl alcohol)	15	879.000
Tetra-(2,2-diallyloxymethylene)-1-butoxy titanium bis-(ditridecyl) phosphite	12	784.500
Tetraethylammonium bromide	12	501.610
Tetraethyl ammonium bromide	15	474.500
Tetraethyl ammonium chloride	12	501.612
Tetraethylene glycol	15	1191.000
Tetraethylene glycol diacrylate	15	1135.000
Tetraethylene glycol dimethacrylate	15	1136.000
Tetraethylenepentamine	15	303.000
Tetraethyl lead	14	186.000
O,O,O',O'-Tetraethyl S,S'-methylene bisphosphorodithioate (Ethion)	13	227.000
Tetraethyl orthosilicate (Tetraethyl silicate)	15	1054.000
Tetrafluoroethylene, monomer	15	1270.000
Tetrafluoromethane (F 14)	15	1271.000
Tetraheptyl ammonium bromide	12	501.635
Tetrahydro-allocimerol(50/50 mixture of tetrahydro-linalool and tetrahydro-myrcenol)	07	169.140
Tetrahydrobenzyl alcohol	03	1437.402
Tetrahydro-3,5-dimethyl-2(1H)-pyrimidinone [3-[4-(trifluoromethyl)phenyl]-1-[2-[4-(trifluoromethyl) phenylethenyl]-2-propenylidinehydrozone	13	166.028
Tetrahydro-5,5-dimethyl-2(1H)-pyrimidinone)3-4-trifluoromethyl)phenyl]-1- 2- 4-(trifluoromethyl) phenyl]-2-propen	13	166.053
Tetrahydro-3,5-dimethyl-2H-1,3,5-thiadiazine-2-thione (DMTT)	13	12.000
Tetrahydrofuran	03	1438.000
Tetrahydrofurfuryl alcohol	15	83.000
Tetrahydrofurfuryl oleate	11	53.000
Tetrahydromyrcenol	07	169.170
1,2,3,4-Tetrahydronaphthalene (Tetralin)	15	186.000
1,2,3,4-Tetrahydro-2-naphthol	03	1438.352
Tetrahydropyrimidine from tall oil fatty acids and propylenediamine	14	174.000
2,2',3,3'-Tetrahydro-3,3,3',3'-tetramethyl-1,1'-spirobi [1H-indene]-5,5',6,6'-tetrol	03	1439.500
Tetrahydrothiophene	15	187.000
Tetrahydrothiophene-1,1-dioxide (Sulfolane)	15	188.000
2,2',4,4'-Tetrahydroxybenzophenone	14	497.000
Tetrahydrozoline hydrochloride	06	348.000
Tetra-isopropoxy titanium (bis dioctyl) phosphite	12	784.550
Tetraisopropyl titanate	15	1061.000
Tetrakis(2-chloroethyl)ethylene diphosphate	15	1035.500
Tetrakis(2-chloroisopropyl)ethylene diphosphate (T-RDT)	15	1035.550
Tetrakis(2-ethylhexyl)titanate	15	1062.000
N,N,N',N'-Tetrakis(2-hydroxyethyl)ethylenediamine	12	338.000
N,N,N',N'-Tetrakis(2-Hydroxyethyl)ethylenediamine, propoxylated	12	338.100
N,N,N',N'-Tetrakis(2-hydroxypropyl)ethylenediamine, propoxylated and ethoxylated	12	339.000
Tetrakis[methylene(3,5-di-tert-butyl-4-hydroxyhydrocinnamate)methane]	15	188.500
1,1,3,3-Tetramethoxypropane	15	1324.000
Tetra methyl ammonium bromide	12	501.637
Tetramethylammonium chloride	12	501.638
1,2,4,5-Tetramethylbenzene (Durene)	03	1442.100
N,N,N',N'-Tetramethyl-1,3-butanediamine	15	304.000
p-(1,1,3,3-Tetramethylbutyl)phenol	03	1443.000
2,4,7,9-Tetramethyl-5-decyne-4,7-diol, ethoxylated	12	768.000
Tetramethylethylenediamine	15	305.000
Tetramethyl, octahydro acetophenone	07	88.800
Tetramethyl octahydro acetyl naphthalene	07	88.810
3,3,4,4-Tetramethylphenol ether	03	1443.200
1,3,6,8-Tetranitro-9H-carbazole	03	1443.600
Tetra octyloxy titanium (bis-tridecyl phosphite)	12	784.100
Tetra/penta glycols, mixed	15	1192.000
Tetrapropyl silicate	15	1055.500
Textile chemicals, other than surface active agents, all other	14	507.000
Thebaine	06	435.000
Theophylline sodium glycinate	06	746.600
Thermoplastic resins,benzenoid, all other	08	52.000
Thermosetting acrylate resins	08	20.030
Thermosetting resins,benzenoid, all other	08	18.000
Thermosetting resins,nonbenzenoid, all other	08	18.100
Thermplastic elastomers (such as styrene-block copolymers, thermoplastic olefin elastomers, thermoplastic polyurethanes elastomers, and co-polyester)	10	5.000
Thiabendazole	06	132.000
1,3,4-Thiadiazole, 2,5-bis(dialkyldithio) derivatives	14	290.000
Thiamine hydrochloride	06	804.000
Thiamine mononitrate	06	805.000
Thiamylal, sodium	06	463.000
Thiazole derivatives, cyclic, other	09	36.000
Thioacetic acid, potassium salt	15	770.500

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
Thiocarbanilide (Diphenylthiourea)	14	137.000
Thiocyanic acid, methylene ester	13	207.500
2-(Thiocyanomethylthio)benzothiazole	13	40.018
2,2'-Thiodiethanol (Thiodiglycol)	15	1193.000
Thiodiethylene bis(3,5-di-tert-butyl-4-hydroxyhydrocinnamat	15	197.400
Thiodiphenol	03	1452.500
O,O'-(Thiodi-4,1-phenylene)bis(o,o-dimethyl phosphorothioate (Temphos)	13	165.025
3,3'-Thiodipropionic acid	15	582.000
3,3'-Thiodipropionitrile	15	455.000
Thiodisuccinic acid	15	582.100
Thioethanol, sodium salt	15	1420.200
Thiolactic acid	15	583.000
Thionicotinamide	03	1452.200
Thiopental, sodium	06	464.000
Thiophene	15	198.000
Thiophenol	03	1453.100
Thiosemicarbazide	15	480.000
Thiostrepton	06	58.000
Thiothixene hydrochloride	06	509.000
Thiourea resins	08	17.010
Thuringiensin	06	837.002
Thyroglobulin	06	695.800
Thyroid	06	696.000
Ticarcillin, disodium	06	19.500
Tilomisole	06	280.500
Timolol maleate	06	321.500
Tin laurate	15	677.800
Titanic acid esters, all other	15	1063.000
Titanium acetylacetonate	15	1281.650
N-2(C-5 to C-17)alkylamido-N-carboxyethyl,N-2-hydroxyetmyl, 3-amino-2-mydroxypropyl phosphate, disodium salt	12	102.600
Tobramycin	06	4.001
Tocainide	06	383.001
d-α Tocopherol	06	815.000
dl-α Tocopherol	06	816.000
d-α Tocopheryl acetate	06	817.000
dl-α Tocopheryl acetate (animal feed grade)	06	818.000
dl-α Tocopheryl acetate (medicinal grade)	06	819.000
d-α Tocopheryl acid succinate	06	821.000
Tolazamide	06	689.000
Tolbutamide	06	690.000
p-Tolualdehyde	07	89.000
Toluene-2,3-(and 3,4)-diamine (35/65 Mixture)	03	1454.803
Toluene-2,4-diamine (4-m-Tolylenediamine)	03	1455.000
Toluene-2,4-(and 2,6)-diamine (80/20 Mixture)	03	1455.313
Toluene-3,4-diamine	03	1455.402
Toluene 2,4-diisocyanate	03	1024.000
Toluene 2,4-and 2,6-diisocyanate (80/20 Mixture)	03	1025.600
Toluene 2,4-and 2,6-diisocyanate (65/35 Mixture)	03	1025.000
Toluene (Toluol) other grades	01	5.000
Toluene High purity (98-100%)	02	27.500
Toluene Other	02	28.500

Chemical name	Sect. No.	Item No.
p-Toluenesulfonamide	03	1459.000
Toluenesulfonamide o-, p-mixtures	11	54.000
p-(p-Toluenesulfonamido)diphenylamine	09	83.000
p-Toluenesulfonic acid	03	1461.000
p-Toluenesulfonic acid, aniline salt	03	1461.300
Toluenesulfonic acid, potassium salt	12	146.000
Toluenesulfonic acid, sodium salt	12	147.000
o-Toluenesulfonyl chloride	03	1466.000
p-Toluenesulfonylhydrazide	09	110.743
p-Toluenesulfonyl isocyanate	03	1025.700
p-Toluenesulfonylsemicarbazide	09	109.800
Toluene xylene sulfonic acid	12	147.500
m-Toluic acid	03	1469.000
p-Toluic acid, methyl ester	03	1471.202
o-Toluidine	03	1473.000
m-Toluidine	03	1472.000
p-Toluidine	03	1474.000
m-Toluidine, ethoxylated	12	356.200
2-o-Toluidinoethanol	03	1478.000
p-Toluoyl chloride	03	1482.202
p-Tolylacetaldehyde	07	89.600
p-Tolyl acetate	07	90.000
2,2'-(m-Tolylimino)diethanol	03	1487.000
p-Tolyl isobutyrate	07	90.100
p-Tolyl octanoate	07	90.400
p-Tolylphenylacetate	07	90.600
Tolyltriazole	03	1487.700
Tretinoin (vitamin A acid)	06	770.000
1,2,4-Triacetoxybenzene	03	1487.200
Trialkyl phosphite	15	1036.000
Trialkyl thiophosphite	15	1036.200
Triallylamine	15	258.200
Triamcinolone	06	667.000
Triamcinolone acetonide	06	668.000
Triamcinolone diacetate	06	669.000
2,4,6-Triamino-5-nitrosopyrimidine	03	1487.802
Triamterene	06	741.000
Triaryl phosphites	09	86.500
1,3,5-Triazine-(1,3,5(2H,4H,6H))-triethanol	15	200.170
Tribasic lead maleate	15	689.000
2,4,6-Tribromophenol	03	1488.289
3,4',5-Tribromosalicylanilide	03	1489.000
Tri(2-butoxyethyl) phosphate	11	102.000
Tributyl acetylcitrate	11	71.100
Tri-n-butylaluminum	15	1363.950
Tri-n-butylamine	15	266.000
Tributyl citrate	11	71.200
Tributylmethylammonium chloride	12	501.750
Tributyl phosphate	15	1039.000
Tributyl phosphite	14	289.000
S,S,S-Tributyl phosphorotrithioate	13	208.000
Tributyltin chloride	13	195.016
Tributyltin fluoride	15	1406.000
Tri(castor oil alkyl)phosphate	12	786.000
Trichloroacetic acid	15	584.000
Trichloroacetonitrile	15	455.400

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
1,2,3(and 1,2,4)-Trichlorobenzene	03	1490.000
1,2,4-Trichlorobenzene	03	1491.000
1,1,1-Trichloro-2,2-bis(p-methoxyphenyl) ethane (Methoxychlor)	13	146.000
3,4,4'-Trichlorocarbanilide	15	203.000
1,1,1-Trichloro-2,2-diphenylethane	03	1492.200
1,1,1-Trichloroethane (Methyl chloroform)	15	1245.000
1,1,2-Trichloroethane (Vinyl trichloride)	15	1246.000
Trichloroethylene	15	1247.000
Trichlorofluoromethane (F 11)	15	1272.000
Trichloromelamine	15	203.500
α-(Trichloromethyl)benzyl acetate (Rosetone)	07	91.000
Trichloromethylsilane	15	1394.000
3-Trichloromethyl-1,2,4-thiadiazole	03	1492.500
N-Trichloromethylthio-4-cyclohexene-1,2-dicarboximide (Captan)	13	34.000
N-Trichloromethylthiophthalimide (Folpet)	13	35.000
1,2,4-Trichloro-5-nitrobenzene	03	1493.000
Trichloronitromethane (Chloropicrin)	13	242.000
2,4,6-Trichlorophenylhydrazine	03	1493.500
Trichlorophenylsilane	03	1494.000
Trichloropropylsilane	15	1395.000
3,5,6-Trichloro-2-pyridinyloxyacetic acid	13	118.064
3,5,6-Trichlorosalicylic acid	03	1494.500
α,α,α-Trichlorotoluene (Benzotrichloride)	03	1495.000
2,4,6-Trichloro-s-triazine (Cyanuric chloride)	03	1499.000
1,3,5-Trichloro-s-triazine-2,4,6-(1H,3H,5H)trione (Trichloroisocyanuric acid)	15	204.000
Trichlorotrifluoroethane	15	1273.000
Trichlorovinylsilane	15	1396.000
Tricresyl phosphate	11	14.000
Tricyclohexyltin hydroxide	13	166.031
1-Tridecanol	15	880.000
Tridecyl alchol, ethoxylated and phosphated, polyalkylene polyamine salt	12	90.010
Tridecyl alcohol, ethoxylated	12	769.000
Tridecyl alcohol, ethoxylated and carbonated, sodium salt	12	319.000
Tridecyl alcohol, ethoxylated and phosphated	12	90.000
Tridecyl alcohol, ethoxylated and sulfated, sodium salt	12	282.000
Tridecyl alcohol, propoxylated and ethoxylated	12	770.000
Tridecylbenzenesulfonic acid	12	139.100
Tridecylbenzenesulfonic acid, sodium salt	12	139.200
Tridecyloxypoly(ethyleneoxy)acetic acid, sodium salt	12	50.000
Tridecyloxypoly(ethyleneoxy)propionic acid, potassium salt	12	18.500
3-(3-Tridecyloxy)propylaminopropyl amine	12	339.600
Tridecylphenol, ethoxylated	12	756.000
Tridecyl phosphate	12	110.300
Tridecyl stearate	15	980.000
Tridecyl stearate	11	124.800
Tridecyl sulfate, sodium salt	12	246.000
Tri(dimethylaminomethyl)phenol	03	1499.208
Tri(2,4-ditertiarybutyl phenyl) phosphite	15	204.500
Triethanolamine	15	381.000
Triethanolamine, ethoxylated	12	340.000
Triethanolamine phosphate ester	12	340.050
Triethanolamine salicylate	12	340.100
Triethanolamine titanate	15	1062.500
Triethyl acetylcitrate	11	71.300
Triethylaluminum	15	1364.000
Triethylamine	15	279.000
Triethylborane	15	1368.800
Triethyl borate	15	1368.804
Triethylboron	15	1368.830
Triethyl citrate	11	71.400
Triethylenediamine	15	305.600
Triethylene glycol	15	1194.000
Triethylene glycol di(caprylate-caprate)	11	127.000
Triethylene glycol di(2-ethylbutyrate)	11	128.000
Triethylene glycol di(2-ethylhexanoate)	11	129.000
Triethylenetetramine	15	306.000
Triethylenetetramine, propoxylated	15	482.500
Tri(2-ethylhexyl) trimellitate	11	54.750
Triethyl orthoacetate	15	1064.000
Triethyl orthoformate	15	1065.000
Triethyl orthopropionate	15	1066.000
Triethyl phosphate	11	103.000
Triethyl phosphite	15	1040.000
Triethyltrimethylenetriamine	09	7.000
Trifluoroacetic acid	15	584.009
Trifluoroacetic anhydride	15	584.010
Trifluoroacetyl chloride	15	584.015
α,α,α-Trifluoro-2,6-dinitro-N,N-dipropyl-p-toluidine (Trifluralin)	13	116.000
α,α,α-Trifluoro-2,6-dinitro-N-ethyl-N-(2-methyl-2-propenyl)-p-toluidine (Ethylfluralin)	13	116.100
Trifluoroethanol	15	1273.490
Trifluoropropene	15	1273.550
Triglyerol monooleate	12	697.550
Tri-n-hexyl aluminum	15	1364.900
Tri-n-hexyltrimellitate	11	54.850
Trihydrogenated tallow ammonium chloride	12	501.800
Triisobutylaluminum	15	1365.000
Triisobutylene polysulfide	14	263.000
Triisodecylamine	12	444.300
Triisodecylphosphite	15	1040.500
Triisodecyl trimellitate	11	54.900
Triisononyl trimellitate	11	54.950
Triiso-octyl phosphite	15	1041.000
Triiso-octyl trimellitate	11	55.000
Triisopropanolamine	15	409.000
Triisopropyl phosphite	15	1042.000
Trilaurylamine	12	444.600
Trimellitic acid esters, all other	11	57.000
Trimellitic anhydride, acid chloride	03	1509.100
Trimellitic trichloride	03	1509.300
Trimer dibasic acids	15	584.100
Trimesic acid	03	1510.000
Trimethobenzamide hydrochloride	06	82.000
Trimethoprim	06	275.000
Trimethoxyboroxine	15	1369.000

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
Tri(methoxymethyl) tri(stearoxymethyl) melamine	15	205.500
(Trimethoxysilyl propyl) didecyl methylammonium chloride	15	1397.050
Trimethylaluminum	15	1366.000
Trimethyl amine	15	292.000
Trimethylamine hydrochloride	15	483.375
Trimethylaminoethyl acrylate chloride polymer	14	448.500
1,2,4-Trimethylbenzene (Pseudocumene)	03	1513.000
1,3,5-Trimethylbenzene (Mesitylene)	03	1513.100
Trimethyl benzyl dioxane	07	91.070
Trimethyl-cyclododeca-trienyl ethanone	07	169.700
Trimethyl-1-cyclohexane	15	206.940
3,3,5-Trimethylcyclohexanol (m-homomenthol)	15	206.950
3,3,5-Trimethyl cyclohexanol (m-Homomenthol)	07	121.800
3,5,5-Trimethyl-2-cyclohexene-1-one (Isophorone)	15	207.000
Trimethyl cyclohexenyl butenone	07	121.850
1-(2,6,6-Trimethyl-2-cyclohexen-1-yl)-1,6-heptadien-3-one (Allyl-α-ionone)	07	122.000
Trimethylcyclohexyl salicylate	07	91.080
2,2,5-Trimethyl-3-(dichloroacetyl)-1,3-oxazolidine	13	175.014
3,5,5-Trimethyl hexanal	07	169.500
1,1,3-Tri(2-methyl-4-hydroxy-5-tert-butylphenyl) butane	09	95.000
1,3,3-Trimethyl-δ^2, α-indolineacetaldehyde	03	1515.000
N,N,N-Trimethyl methanaminium octahydrotriborate	15	1370.500
1,3,3-Trimethyl-2-methyleneindoline	03	1516.000
Trimethyl(mixed alkyl)ammonium chloride	12	502.000
2,6,8-Trimethyl-4-nonanol	15	881.000
2,6,8-Trimethyl-4-nonanone (Isobutyl heptyl ketone)	15	838.000
Trimethylnonyl alcohol, ethoxylated	12	773.000
Trimethyl norbornane methanol	07	122.020
Trimethyloctadecylammonium chloride	12	503.000
Trimethylolpropane, alkoxylated	12	774.000
Trimethylolpropane decanoic acid ester	15	1139.000
Trimethylol propane ester	14	291.000
Trimethylolpropane ethoxylate triacrylate	15	1139.400
Trimethylolpropane triacrylate	15	1140.000
Trimethylolpropane tri(2-mercaptopropionate)	15	1140.005
Trimethylolpropane trimethacrylate	15	1140.010
Trimethylolpropane trioleate	11	95.700
Trimethylolpropane trioleate (TMP trioleate)	15	1140.300
Trimethyl orthoacetate	15	1066.200
Trimethyl orthoformate	15	1068.000
2,2,4-Trimethylpentane (Iso-octane)	02	76.000
2,2,4-Trimethyl-1,3-pentanediol	15	1095.000
Trimethylpentanediol, ethoxylated	12	773.500
2,2,3-Trimethyl-1,3-pentanediol monoisobutyrate	15	1140.500
Trimethyl phosphite	15	1043.000
Trimethylsilyldiazo-methane	15	1397.200
Trimethyl(soybean oil alkyl)ammonium chloride	12	504.000
Trimethyl(tallow alkyl)ammonium chloride	12	505.000
Trimethyltetradecylammonium bromide	12	506.000
trimethyl trimellitate	11	55.400
a,a,5-Trimethyl-5-vinyl-furfuryl alcohol and tetrahydro 2,2,6-trimethyl-6-vinyl-3-ol	07	122.200
5-(2,2,3-Trimethyl(cyclopent-3-en-1-yl)-3-methylpentan-2 ol	07	122.010
Tri(mixed alkyl)amine	12	444.700
2,4,6-Trinitroresorcinol and lead derivative	15	208.000
Tri-n-octylaluminum	15	1366.400
Trioctylamine	12	445.000
Tri-n-octyl n-decyl trimellitate	11	55.600
Trioctyl trimellitate	11	56.000
Tri-oxyaluminum tri-isopropoxide	15	1366.500
Tripelennamine	06	111.000
Tripelennamine citrate	06	112.000
Tripelennamine hydrochloride	06	113.000
Tripentylamine	15	297.000
Triphenylmethane	03	1523.602
Triphenyl phosphate	11	15.000
Triphenylphosphine	03	1523.700
Triphenyl phosphite	15	210.000
Triphenylsulfonium chloride	03	1523.750
Triphenyltin hydroxide	15	211.200
Triprolidine hydrochloride	06	114.000
Tripropylamine	15	302.000
Tripropylene glycol	15	1195.000
Tripropylene glycol diacrylate	15	1140.600
Tripropylene glycol monomethyl ether	15	1195.500
Tris(2-chloroethyl)phosphate	15	1043.998
Tris(2-chloroethyl) phosphite	15	1044.000
Tris-2-chloropropyl phosphate	15	1045.400
Tris(3,5-di-tert-butyl-y-hydroxybenzyl)isocyanurate	15	211.400
α,α',α''-Tris(dimethylamino)mesitol	03	1525.000
Tris(2-ethylhexyl)phosphite	15	1048.000
Tris(2-methoxyethoxy)vinyl silane	15	1396.500
Tris(2-methyl-1-aziridinyl)phosphine oxide	03	1526.000
Tris(pentamethyldisiloxanyl)-3-methacrylatopropylsilane	15	1397.500
Tri- and tetraethyle glycol monoethyl ethers, borate esters	15	1193.800
Tri(tridecyl)amine	12	446.100
Tubocurarine	06	481.000
Tylosin	06	77.000
Undecanal	07	170.000
Undecanol (linear c_{11} alcohol)	15	869.700
9-Undecenal	07	171.000
Urea-formaldehyde resins	08	17.000
Urea in feed compounds (100% Basis)	14	509.000
Urea in liquid fertilizer (100% Basis)	14	510.000
Urea in plastics (100% Basis)	14	512.000
Urea in solid fertilizer (100% Basis)	14	511.000
Urea polymers with formaldehyde and methanol	14	503.000
Urea, polymer with tetrakishydroxymethylphosphonium sulfate	14	506.000
Urea, primary solution (Report on 100% urea-content basis)	14	508.000
7,7'-Ureylenebis4-hydroxy-2-naphthalenesulfonic acid (J-Acid urea)	03	1528.000
Uricase	14	128.000
Valeraldehyde (Pentanal)	15	804.000
Valeric acid	15	585.000
Valeroyl chloride	15	585.050
Valproic acid	06	423.900

Table D-1—Continued
Alphabetical chemical index

Chemical name	Sect. No.	Item No.
Vancomycin	06	61.000
Vanillin propylene glycol acetal	07	44.400
Vat Black 16	04	1206.016
Vat Black 25, 12-1/2%	04	1209.000
Vat Blue 1, 20%	04	1164.000
Vat Blue 6, 8-1/3%	04	1167.000
Vat Blue 16, 16%	04	1171.000
Vat Blue 19	04	1172.019
Vat Blue 20, 14%	04	1173.000
Vat Blue 29	04	1173.029
Vat Blue 43	04	1175.000
Vat Blue 66	04	1175.066
Vat Brown 1, 11%	04	1187.000
Vat Brown 57, 12.8%	04	1200.000
Vat brown dyes, all other	04	1201.000
Vat Green 1, 6%	04	1178.000
Vat Green 3, 10%	04	1180.000
Vat Green 7	04	1180.007
Vat Green 8, 8-1/2%	04	1182.000
Vat green dyes, all other	04	1186.000
Vat Orange 2, 12%	04	1131.000
Vat Orange 7, 11%	04	1136.000
Vat Red 10, 18%	04	1144.000
Vat Red 15, 10%	04	1148.000
Vat red dyes, all other	04	1154.000
Vat Violet 1, 11%	04	1155.000
Vat Violet 13, 6-1/4%	04	1159.000
Vegetable glycerides, hydrogenated	15	1330.400
Vegetable oils, sulfated, all other	12	313.000
Veratraldehyde (3,4-Dimethoxybenzaldehyde)	03	1529.000
Very high molecular weight (>1000) hydrocarbons	14	292.000
Vetivenol	07	124.000
Vetivenyl acetate	07	125.000
Vinblastine sulfate	06	281.000
Vincristine sulfate	06	282.000
Vinyl acetate-acrylate copolymers	08	50.080
Vinyl acetate, monomer	15	1069.000
Vinyl bromide (Bromoethylene)	15	1215.000
Vinyl chloride-acetate copolymer resins	08	50.090
Vinyl chloride, monomer (Chloroethylene)	15	1250.000
Vinylcyclohexene monoxide	03	1531.503
Vinyl fluoride, monomer	15	1274.000
Vinylidene chloride, monomer (1,1-Dichloroethylene)	15	1251.000
Vinylidene fluoride, monomer	15	1275.000
2-Vinylpyridine	03	1535.000
4-Vinylpyridine	03	1536.000
1-Vinyl-2-pyrrolidinone other copolymers	15	216.000
1-Vinyl-2-pyrrolidinone-methylacrylic acid, dimethylamine ethyl ester, copolymer	15	214.000
1-Vinyl-2-pyrrolidinone, monomer	15	215.000
1-Vinyl-2-pyrrolidinone, polymers	14	450.000
1-Vinyl-2-pyrrolidinone vinyl acetate copolymer	15	217.000
Vinyl resins, all other	08	51.000
Vinyl toluene alkyds	08	3.800
Vinyltriethoxysilane	15	1398.000
Vinyl trimethoxy silane	15	1398.300
Violet 5:1	05	220.000
Violet 27	05	93.227
Vitamin A, all other	06	776.000
Vitamin D, all other	06	814.000
Vitamin A acetate (animal feed grade)	06	771.000
Vitamin A acetate (medicinal grade)	06	772.000
Vitamin A alcohol	06	773.000
Vitamin A palmitate (medicinal grade)	06	775.000
Warfarin	06	632.000
Waxes and paraffinic products	09	178.800
Wool wax alcohols, ethoxylated	12	740.500
Xanthan gum	14	451.000
o-Xylene (90-100% of o-xylene isomer)	03	1540.000
m-Xylene (90-100% of m-xylene isomer)	03	1539.000
p-Xylene (90-100% Of p-xylene isomer)	03	1541.000
Xylene High purity (98-100%)	02	30.500
Xylene Other	02	31.500
2,4-Xylenesulfonic acid	03	1542.800
Xylenesulfonic acid, ammonium salt	12	148.000
Xylenesulfonic acid, mixed isomers	03	1543.502
Xylenesulfonic acid, sodium salt	12	150.000
2,5-Xylenol	03	1544.200
2,6-Xylenol	03	1544.500
3,5-Xylenol	03	1544.503
Xylenol crystals	03	1544.000
Xylenol, low boiling point	03	1545.000
Xylidine, original mixture	03	1550.000
Xylose (intestinal malabsorption test)	06	581.500
Zeranol	06	643.000
Zinc acetate	15	606.000
Zinc acetylacetonate complex	15	1408.900
Zinc t-α-alkylcarboxylate	15	671.950
Zinc citrate	15	626.300
Zinc dialkyldithiophosphate	14	235.000
Zinc dialkylphenol dithiophosphate	14	236.000
Zinc dibutyl phosphorodithioate	14	239.000
Zinc 2-ethylhexanoate	15	644.000
Zinc gluconate	06	767.300
Zinc hydrocarbon dithiophosphate	14	242.000
Zinc isopropyl xanthate	09	154.800
Zinc laurate (Activator, physical property improver, and processing auxiliary)	09	179.000
Zinc naphthenate	14	315.000
Zinc neodecanoate	15	710.000
Zinc phenolsulfonate	06	560.000
Zinc salicylate	06	560.500
Zinc stearate	15	763.000
Zinc tallate	15	178.000
Zinc undecylenate	06	140.000
Zirconium acetate	15	607.000
Zirconium t-α-alkylcarboxylate	15	671.975
Zirconium 2-ethylhexanoate	15	645.000
Zirconium neodecanoate	15	711.000

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