

4. PRODUCTION, IMPORT, USE, AND DISPOSAL

4.1 PRODUCTION

Since before World War II, multimillion pound quantities of cresols have been produced annually in the United States (O'Brochta 1949), and domestic production and sales of cresols have steadily increased in recent years. Approximately 57.3 (USITC 1986), 73.3 (USITC 1988), and 82.3 (USITC 1989) million pounds of cresols were produced annually in the United States in 1986, 1987, and 1988, respectively. Respective sales were 56.6 (USITC 1986), 66.8 (USITC 1988), and 72.1 (USITC 1989) million pounds. These production totals include data on the manufacture of cresylic acid and exclude information on cresol production by coke and gas-retort ovens. The commercial mixture of cresol isomers, in which the m-isomer predominates and contains less than 5% phenol, is sometimes referred to as cresylic acid (Windholz et al. 1983). However, cresylic acids generally are composed of cresols, phenols, and xylenols; they are defined as those mixtures in which over 50% will boil at temperatures above 204 °C (Sax and Lewis 1987). In 1987, the national capacity for producing cresylics was 208 million pounds per year (CMR 1987). Information regarding the production levels of individual isomers and specific mixtures was unavailable.

Cresols are used widely by industry. Information from the EPA's Toxic Release Inventory (TRI) on facilities that either manufactured or processed cresols in 1987 is outlined in Table 4-1. The TRI data should be used with caution since the 1987 data represent first-time reporting by these facilities. Only certain types of facilities were required to report. This is not an exhaustive list. According to the United States International Trade Commission (USITC 1987, 1988, 1989) and the 1989 Directory of Chemical Producers (SRI 1989), cresols are currently produced by five manufacturers in New York, New Jersey, Pennsylvania, Illinois, and Texas. USITC (1987, 1988, 1989) and Stanford Research Institute (SRI 1989) data for individual isomers and the mixture o-, p-, and m-isomers are included in Tables 4-2a through 4-2d. Data from the TRI do not agree with those from the USITC and SRI. For example, the Sloss Industries Coke Plant, which appears to meet SRI and USITC production criteria, was not listed with USITC (1987, 1988, 1989) or SRI (1989).

The oldest cresol production method used in the United States is through the recovery of fractional distillates from coal tars. Most domestic cresols are formed via catalytic and thermal cracking of naphtha fractions during petroleum distillation. Since 1965, quantities of coal tar and petroleum isolates have been insufficient to meet the rising demand. Consequently, several processes for the manufacture of the various isomers have been developed. One General Electric facility produces o-cresol at an annual capacity of 10,000 tons by the methylation of phenol in the presence of catalysts. The Sherman-Williams Company uses the toluene sulfonation process and maintains an annual capacity for p-cresol of 15,000 tons. The Hercules Powder Company produced p-cresol until 1972 by the cymene-cresol process.

TABLE 4-1. Facilities that Manufacture or Process Cresols^a

Facility	Location	Maximum amount on site (lbs)	Use
Sloss Industries Corporation Coke Plant	Birmingham, AL	100,000-999,999	Produce; as an impurity
Chem-Four First, Ltd.	Demopolis, AL	1,000-9,999	Import; as a reactant
Koppers Company, Inc.	Dolomite, AL	10,000-99,999	Import; for sale/distribution; as an article component; in ancillary or other uses
Empire Coke Company	Holt, AL	10,000-99,999	Produce; for on-site use/processing; for sale/distribution; as an impurity
Merichem Company, Inc. (Black Warrior Plant)	Holt, AL	10,000-99,999	As an impurity
Ciba-Geigy Corporation	McIntosh, AL	100,000-999,999	As a reactant
CPS Chemical Company Of Arkansas	West Memphis, AR	100,000-999,999	In re-packaging
Ansell Incorporated	Tucson, AZ	1,000-9,999	As a formulation component
BASF Corporation Coatings and Inks Division	Anaheim, CA	10,000-99,999	As a reactant; as a formulation component
FMC Corporation	Fresno, CA	100,000-999,999	As a formulation component
Blue Coral Inc., McKay Chemical Div.	Los Angeles, CA	1,000-9,999	For on-site use/processing; as a formulation component
Tosco Corporation	Martinez, CA	1,000-9,999	As a processing aid
PMC Specialties Group	Santa Fe Springs, CA	100,000-999,999	For sale/distribution; as a formulation component
Mobil Oil Corporation Refinery	Torrance, CA	1,000,000-9,999,999	Produce; as a formulation component
Uniroyal Chemical Company, Inc.	Naugatuck, CT	100-999	Produce; as an impurity
Texaco	Delaware City, DE	No data	As a reactant
Wilmington Chemical Corporation	New Castle, DE	10,000-99,999	Produce; for on-site use/processing; as a byproduct
Harris Corporation Semiconductor	Palm Bay, FL	10,000-99,999	As a reactant
Westinghouse Electric Corporation	Athens, GA	1,000-9,999	As a manufacturing aid
Zep Manufacturing Company	Atlanta, GA	1,000-9,999	As a processing aid
Amoco Performance Products Inc.	Augusta, GA	1,000-9,999	As an article component
Amrep, Inc.	Cartersville, GA	100,000-999,999	As a processing aid
G.E. Co., Medium Transformer Operation	Rome, GA	1,000-9,999	As an article component
Acme Steel Company	Chicago, IL	10,000-999,999	As a manufacturing aid
PMC Specialties Group	Chicago, IL	100-999	As a byproduct
		100-999	Produce; for on-site use/processing; for sale/distribution; as a formulation component
		100-999	Produce; as a byproduct; as an impurity
		1,000-9,999	Produce; for on-site use/processing; for sale/distribution; as a reactant; as a formulation component
Koppers Company, Inc.	Cicero, IL	100,000-999,999	Import; as an impurity

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TABLE 4-1 (Continued)

Facility	Location	Maximum amount on site (lbs)	Use
Spaulding Composites Specialty Plastics Div.	Dekalb, IL	10,000-99,999	As a reactant
Chicago Magnet Wire Corp.	Elk Grove Village, IL	10,000-99,999	As a processing aid
Borden, Inc. Chemical Division	Forest Park, IL	10,000-99,999	Import; for on-site use/processing; as a reactant; as a formulation component
Reilly Tar and Chemical Corporation	Granite City, IL	100,000-999,999	In re-packaging
Mobil Joliet Refining Corporation	Joliet, IL	100,000-999,999	Produce; for on-site use/processing; for sale/distribution; as a byproduct; as an impurity; as a reactant; in ancillary or other uses
Essex Group Inc.	Rockford, IL	10,000-99,999	As a formulation component
Shell Oil Company	Roxana, IL	100,000-999,999	Produce; as a byproduct
Essex Group Inc.	Fort Wayne, IN	10,000-99,999	As a formulation component
Essex Inc., Chemical Processing Plant	Fort Wayne, IN	100,000-999,999	As a formulation component
General Electric Company Motor Business	Fort Wayne, IN	10,000-99,999	As a processing aid
Phelps Dodge Magnet Wire Co.	Fort Wayne, IN	100,000-999,999	As a formulation component
Rea Magnet Wire Company, Inc.	Fort Wayne, IN	10,000-99,999	As a formulation component; as a processing aid
Citizens Gas and Coke Utility	Indianapolis, IN	100,000-999,999	Produce; for sale/distribution; as a byproduct
Essex Group Inc.	Kendalville, IN	10,000-99,999	As a reactant; as a formulation component; as an article component; as a processing aid
Rea Magnet Wire Co., Inc.	Lafayette, IN	10,000-99,999	As a processing aid
New Haven Wire and Cable, Inc.	New Haven, IN	10,000-99,999	As a processing aid
Total Petroleum, Inc.	Arkansas City, KS	10,000-99,999	Produce
Texaco Ref. and Mktg., Inc.	El Dorado, KS	100,000-999,999	Produce; for sale/distribution; as a byproduct; as an impurity
Koch Chemical Company	Pittsburg, KS	10,000-99,999	As a reactant
Phelps Dodge Magnet Wire Co.	Hopkinsville, KY	No data	
Borden, Inc. - Chemical Division	Louisville, KY	10,000-99,999	As a reactant
		1,000-9,999	As a reactant
		1,000-9,999	As a reactant
Hi-Tek Polymers, Inc. Plant 2700	Louisville, KY	10,000-99,999	As a reactant
Exxon	Baton Rouge, LA	1,000-9,999	Produce; import; for on-site use/processing; for sale/distribution; as an impurity; as a formulation component
Exxon Chemical Americas	Baton Rouge, LA	100,000-999,999	Produce; as an impurity
Hoechst Celanese Corporation	Baton Rouge, LA	10,000-99,999	As a formulation component
Marathon Petroleum Company	Garyville, LA	1,000-9,999	Produce; as a byproduct
Uniroyal Chemical Co., Inc.	Geismar, LA	100,000-999,999	Import; as a reactant
Citgo Petroleum Corporation	Lake Charles, LA	1,000,000-9,999,999	As a processing aid

TABLE 4-1 (Continued)

Facility	Location	Maximum amount on site (lbs)	Use
Du Pont Pontchartrain Works	Laplace, LA	100,000-999,999	In ancillary or other uses
Murphy Oil USA, Inc.	Meraux, LA	100,000-999,999	As a byproduct
General Electric Company	Shreveport, LA	1,000-9,999	As a manufacturing aid
Conoco Lake Charles Refinery	Westlake, LA	10,000-99,999	As an impurity; as a processing aid
PPG Industries, Inc.	Westlake, LA	10,000-99,999	As a processing aid
Sippican, Inc.	Marion, MA	1,000-9,999	As a manufacturing aid
Anderson Development Company	Adrian, MI	1,000-9,999	As a manufacturing aid
Allied-Signal, Inc.	Detroit, MI	10,000-99,999	As a reactant
Koch Refining Company	St. Paul, MN	10,000-99,999	As a formulation component
Dundee Cement Company	Clarksville, MO	1,000-9,999	As an impurity
Safety Kleen Corporation	Clarksville, MO	10,000-99,999	In ancillary or other uses
Westinghouse Electric Corporation	Jefferson City, MO	10,000-99,999	In ancillary or other uses
P. D. George Company	St. Louis, MO	100,000-999,999	In ancillary or other uses
Borg-Warner Chemicals, Inc. Baymar	Bay St. Louis, MS	100,000-999,999	As a formulation component
Magnetek Universal Manufacturing	Mississippi, MS	10,000-99,999	Produce; for on-site use/processing; as a reactant
Amerada Hess Corporation	Furvis, MS	No Data	As a manufacturing aid; in ancillary or other uses
Sandoz Chemicals Corporation Mt. Holly Plant	Charlotte, NC	10,000-99,999	As a byproduct
General Electric Company Lighting Systems Dept.	Hendersonville, NC	10,000-99,999	As a reactant
General Electric Company Transformer Bus. Dept.	Hickory, NC	10,000-99,999	As a formulation component
Rea Magnet Wire Company, Inc.	Laurinburg, NC	No Data	As a manufacturing aid
Southeastern Adhesives Company	Lenoir, NC	10,000-99,999	As a processing aid
Radiator Specialty Co.	Matthews, NC	0-99	As a manufacturing aid
Thiele-Engdahl, Inc.	Winston-Salem, NC	10,000-99,999	As a formulation component
Elektrisola Inc.	Boscawen, NH	10,000-99,999	As a formulation component; in ancillary or other uses
Concord Chemical Co., Inc.	Camden, NJ	10,000-99,999	As a formulation component
Henkel Corporation	Carlstadt, NJ	100,000-999,999	Import; as a formulation component
Givaudan Corporation	Clifton, NJ	10,000-99,999	As a reactant
Du Pont Chambers Works	Deepwater, NJ	10,000-99,999	As a reactant
FMC Specialties Group	Fords, NJ	10,000-99,999	As a reactant
American Cyanamid Company Warners Plant	Linden, NJ	100,000-999,999	As a reactant
Union Carbide Corporation Bound Book Plant	Piscataway, NJ	10,000-99,999	As a reactant
Ciba-Geigy Corporation	Toms River, NJ	10,000-99,999	As a reactant
Diaz Chemical Corporation	Holley, NY	10,000-99,999	As a reactant
BTL Specialty Resins Corp.	Niagara Falls, NY	10,000-99,999	As a reactant
		100,000-999,999	As a reactant

TABLE 4-1 (Continued)

Facility	Location	Maximum amount on site (lbs)	Use
Occidental Chemical Corp. Durez Division	North Tonawanda, NY	10,000-99,999	As a reactant
General Electric Company Insulating Materials	Rotterdam, NY	10,000-99,999	As a reactant; as a formulation component; as an article component
Schenectady Chemicals, Inc.	Rotterdam Junction, NY	10,000-99,999	As a reactant
		10,000-99,999	As a reactant
		10,000-99,999	As a reactant
Schenectady Chemicals, Inc.	Schenectady, NY	10,000-99,999	As a formulation component
		100,000-999,999	As a reactant; as a formulation component; in ancillary or other uses
General Electric Plastics	Selkirk, NY	No data	Produce; as a byproduct
BASF Corporation Coatings and Inks Division	Cincinnati, OH	10,000-99,999	As a reactant
		10,000-99,999	As a reactant
Hilton Davis Co.	Cincinnati, OH	100,000-999,999	As a reactant
Ashland Chemical Company	Cleveland, OH	10,000-99,999	As a reactant
Reilly Tar and Chemical Corporation	Cleveland, OH	100,000-999,999	In re-packaging
General Electric Company Electromaterials Department	Coshocton, OH	10,000-99,999	As a reactant
Nordson Corporation-RBX Div.	Elyria, OH	1,000-9,999	As a manufacturing aid
Allied-Signal Inc.	Ironton, OH	1,000,000-9,999,999	As a formulation component
New Boston Coke Corporation	New Boston, OH	100,000-999,999	Produce; as a byproduct
Conoco Refinery	Ponca City, OK	100,000-999,999	As an impurity; as a processing aid
Moore Business Forms And Systems Division	Stillwater, OK	10,000-99,999	As a reactant
Aristech Chemical Corporation Tarben Plant	Clairton, PA	10,000-99,999	In re-packaging
		10,000-99,999	In re-packaging
		10,000-99,999	In re-packaging
Westinghouse Electric Corporation	Manor, PA	100,000-999,999	As a reactant; as a formulation component; in re-packaging; in ancillary or other uses
Arco Chemical Company	Monaca, PA	10,000-99,999	As a processing aid
Neville Synthese Organics Inc.	Oil City, PA	10,000-99,999	Produce; for sale/distribution; as a reactant
		10,000-99,999	Produce; for sale/distribution
		10,000-99,999	As a reactant
		10,000-99,999	As a reactant
Rohm and Haas, Inc. Delaware Valley, Philadelphia	Philadelphia, PA	10,000-99,999	As a reactant
Pennzoil Products Company	Rouseville, PA	10,000-99,999	Produce; as an impurity; as a reactant
Olin Hunt Specialty Products Inc.	Lincoln, RI	1,000-9,999	As an article component
Hardwicke Chemical Co.	Elgin, SC	100,000-999,999	As a reactant
Westinghouse Electric Corporation Lower Neches	Hampton, SC	100,000-999,999	As a reactant

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TABLE 4-1 (Continued)

Facility	Location	Maximum amount on site (lbs)	Use
Essex Group Inc.	Franklin, TN	10,000-99,999	As a processing aid; in ancillary or other uses
Doehler-Jarvis	Greeneville, TN	1,000-9,999	For on-site use/processing; as a reactant
Mapco Petroleum, Inc.	Memphis, TN	10,000-99,999	Produce; as a byproduct
W.m. Barr And Company, Inc.	Memphis, TN	10,000-99,999	As a formulation component
Berryman Products, Inc.	Arlington, TX	100,000-999,999	As a formulation component; in re-packaging
Beaumont Refinery	Beaumont, TX	100,000-999,999	As a reactant
Neches River Treatment Corporation	Beaumont, TX	100-999	In ancillary or other uses
Arco Chemical Company	Channelview, TX	10,000-99,999	As a processing aid
The Goodyear Tire and Rubber Co.	Cheek, TX	10,000-99,999	As a reactant
Koch Refining Company	Corpus Christi, TX	100,000-999,999	For sale/distribution; as a byproduct
Zep Manufacturing Company	De Soto, TX	10,000-99,999	As an article component
W. J. Smith Wood Preserving Company	Denison, TX	10,000-99,999	As an article component
		10,000-99,999	As an article component
The Dow Chemical Company Texas Operations	Freeport, TX	100,000-999,999	As a reactant
Hill Petroleum Company	Houston, TX	1,000-9,999	As an impurity
Koppers Company, Inc.	Houston, TX	1,000-9,999	For on-site use/processing; for sale/distribution; as an article component; in ancillary or other uses
Amrep, Inc.	Lancaster, TX	1,000-9,999	As an article component
Reilly Tar and Chemical Corporation	Lone Star, TX	100,000-999,999	In re-packaging
Crown Central Petroleum Corporation	Pasadena, TX	10,000-99,999	Produce; as a byproduct
Hoechst Celanese Corporation Bayport Works	Pasadena, TX	10,000-99,999	Import; as a processing aid
Sea Lion Chemical	Texas City, TX	10,000-99,999	Produce
		10,000-99,999	As a reactant
Sterling Chemicals, Inc.	Texas City, TX	1,000-9,999	As a processing aid
Du Pont	Victoria, TX	1,000-9,999	Produce; as an impurity
Kennecott Utah Copper	Copperton, UT	100,000-999,999	As a reactant; as a processing aid
Reilly Tar & Chemical Corporation	Provo, UT	100,000-999,999	In re-packaging
Westinghouse Electric Corp. Wire Division	Abingdon, VA	10,000-99,999	As a manufacturing aid
Northwest Petrochemical Corporation	Anacortes, WA	1,000,000-9,999,999	Produce; for sale/distribution
Mobil Oil Corporation	Ferndale, WA	10,000-99,999	Produce; for sale/distribution; as a byproduct
Plastics Engineering Company	Sheboygan, WI	100,000-999,999	As a reactant
Koppers Company, Inc.	Follansbee, WV	1,000,000-9,999,999	Import; for sale/distribution; as a byproduct; as an impurity
Akzo Chemicals Inc.	Gallipolis Ferry, WV	1,000,000-9,999,999	As a reactant
FMC Corporation	Nitro, WV	1,000,000-9,999,999	As a reactant

^aDerived from TRI 1989

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TABLE 4-2a. Current U.S. Producers of o-Cresol^a

Company	Location ^b
PMC Inc. PMC Specialties Group Division	Chicago, IL
General Electric Company GE Plastics	Selkirk, NY
Merichem Company	Houston, TX
Northwest Petrochemical Corporation	Anacortes, WA

^aDerived from SRI 1989; USITC 1989.

^bMay represent headquarters rather than production facilities.

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TABLE 4-2b. Current U.S. Producers of p-Cresol^a

Company	Location ^b
PMC Inc.	
PMC Specialties Group Division	Chicago, IL
Merichem Company	Houston, TX
Bell Flavors and Fragrances Inc.	Northbrook, IL
Sherman-Williams Company	Oakland, NJ

^aDerived from SRI 1989; USITC 1989; Fiege and Bayer 1987.

^bMay represent headquarters rather than production facilities.

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TABLE 4-2c. Current U.S. Producers of m-Cresol^a

Company	Location ^b
Merichem Company	Houston, TX ^c
Neville-Synthese Organics Inc.	Oil City, PA

^aDerived from SRI 1989; USITC 1989.

^bMay represent headquarters rather than production facilities.

^cAlso produces a mixture of m- and p-isomers.

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TABLE 4-2d. Current U.S. Producers of the Mixture of o-, p- and m-Cresols^a

Company	Location ^b
PMC Inc.	
PMC Specialties Group Division	Chicago, IL
General Electric Company	
GE Plastics	Selkirk, NY
Merichem Company	Houston, TX
Northwest Petrochemical Corporation	
Stimson Lumber Company	Anacortes, WA ^c

^aDerived from SRI 1989; USITC 1989.

^bMay represent headquarters rather than production facilities.

^cPlant is currently shut down and up for sale.

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This method is capable of producing p- or m-cresol from the corresponding cymene (isopropyltoluene). Alkaline chlorotoluene hydrolysis is used to formulate a cresol mixture with a high m-cresol content. However, information pertaining to domestic use of this process was unavailable (Fiege and Bayer 1987).

4.2 IMPORT/EXPORT

Just over 13.5 million pounds of cresols were imported into the United States in 1983. Table 4-3 contains import data for 1983. More recent information on U.S. imports was not located.

4.3 USE

A considerable amount of o-cresol is consumed directly as either a solvent or disinfectant. o-Cresol is also used as a chemical intermediate for a wide variety of products. o-Cresol is hydrogenated to 2-methylcyclohexanol or 2-methylcyclohexanone, which are also solvents. Coumarin is made from the carbonate ester of o-cresol and is a deodorizing and odor-enhancing agent that also has pharmaceutical applications (Sax and Lewis 1987). Alkylation of o-cresol with propene gives 3-isopropyl-6-methylphenol (carvacrol). Carvacrol is used as an antiseptic and in fragrances (Windholz et al. 1983). o-Cresol also serves as an intermediate for the production of various antioxidants. Several dye intermediates are manufactured from o-cresol. o-Cresotinic acid, produced from o-cresol via the Kolbe synthesis, is used as a dye, a dye intermediate, and a pharmaceutical intermediate. Recently, an increasing proportion of o-cresol has been devoted to the formulation of epoxy-o-cresol novolak (ECN) resins. ECN resins are sealing materials for integrated circuits (silicon chips). o-Cresol is also used as an additive to phenolformaldehyde resins. The manufacture of certain herbicides and pesticides, including 4-chloro-2-methylphenoxyacetic acid (MCPA), γ (4-chloro-2-methylphenoxy)-propionic acid (MCPB), 7(4-chloro-2-methylphenoxy)-butyric acid (MCPB), and 4,6-dinitro-o-cresol (DNCO), is also dependent upon o-cresol (Fiege and Bayer 1987).

p-Cresol is used largely in the formulation of antioxidants such as 2,6-di-tert-butyl-p-cresol (BHT), 2,6-dicyclopentyl-p-cresol, 2,2'-methylenebis(2,2'-thiodiphenols), and Tinuvin 326. Tinuvin 326 absorbs ultraviolet (UV) light and is added to polyethylene and polypropylene films and coatings for protection against photodegradation. p-Cresol also has many applications in the fragrance and dye industries (Windholz et al. 1983). Synthetic food flavors also contain p-cresol (Sax and Lewis 1987). p-Cresol carboxylic acid esters and anisaldehyde are used in perfumes (Sax and Lewis 1987). The latter is made from p-cresol methyl ether (Fiege et al. 1987).

m-Cresol, either pure or mixed with p-cresol, is important in the production of contact herbicides such as O,O-dimethyl-O-(3-methyl-4-nitrophenyl)thionophosphoric acid (fenitrothion, Follithion, and Sumithion),

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TABLE 4-3. Recent U.S. Imports of Cresols^a

Chemical name	Import volume (in thousands of pounds)
o-Cresol	43.0
p-Cresol	1,996.6
m-Cresol	2,892.3
(o,m)-Cresol	381.6
(m,p)-Cresol	8,188.6

^aDerived from USITC 1984.

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and O,O-dimethyl-O-(3-methyl-4-methylthiophenyl)thionophosphoric acid ester (fenthion; Baytex, and Lebaycid) (Fiege and Bayer 1987). m-Cresol is also a precursor to the pyrethroid insecticides. Furthermore, many flavor and fragrance compounds, such as (-)-methanol and musk ambrette, are derived from m-cresol. Several important antioxidants are produced from m-cresol. m-Cresol is also used to manufacture an explosive, 2,4,6-nitro-m-cresol.

Mixtures of m- and p-cresol often serve as disinfectants and preservatives (Windholz et al. 1983). Because cresols are bactericides and fungicides, they are added to soaps as disinfectants. Crude cresols are used as wood preservatives. Tricresyl phosphate and diphenyl cresyl phosphate are produced from m- and p-cresol mixtures. These neutral phosphoric acid esters are used as flame-retardant plasticizers for polyvinylchloride (PVC) and other plastics, fire-resistant hydraulic fluids, additives for lubricants, and air filter oils. Cresol mixtures condensed with formaldehyde are important for modifying phenolic resins. However, the m-isomer content is critical to the mixture because m-cresol is the most reactive of the three isomers. Cresols are also used in paints and textiles. Mixtures of cresols are used as solvents for synthetic resin coatings such as wire enamels, metal degreasers, cutting oils, and agents to remove carbon deposits from combustion engines. Other uses of cresol mixtures include ore flotation and fiber treatment (Fiege and Bayer 1987; Windholz et al. 1983).

4.4 DISPOSAL

Cresols may be disposed of by landfill/land applications, biological waste water treatment, or incineration. In an activated sludge system, cresols exhibit a 96% reduction of the chemical oxygen demand and a biodegradation rate of 55 mg of oxygen/g-hour. Cresols may be disposed of in a rotary kiln incinerator with a temperature range of 820 °C-1600 °C and a residence time of seconds. Cresols may also be disposed of in a fluidized bed incinerator with a temperature range of 450 °C-980 °C and a residence time of seconds (HSDB 1989).

