

4. PRODUCTION, IMPORT, USE AND DISPOSAL

4.1 PRODUCTION

1,2-Dichloropropane is produced by Columbia Organics in Cassatt, SC, Dow Chemical in Freeport, TX and Dow Chemical in Plaquemine, LA (SRI 1988; USITC 1987); however, Dow Chemical Company is the only manufacturer of the isolated chemical in the United States (EPA 1986c). The total output of 1,2-dichloropropane by U.S. manufacturers remained relatively stable until 1984 when a major manufacturer, Mannsville Chemical Products Corporation, discontinued production (IARC 1986). The domestic production volume of 1,2-dichloropropane during 1984 was 59.8 million pounds (IARC 1986). Over 95% of the approximately 75 million pounds produced in 1982 was used on site as a captive chemical intermediate in the production of perchloroethylene and other chlorinated products (EPA 1986c, Dow Chem. Co. 1983). High-purity 1,2-dichloropropane, marketed as a solvent, is obtained as a by-product of the synthesis of propylene oxide by the chlorohydrin process. The high-purity product may also be obtained by the reaction of propylene and chlorine in the presence of an iron oxide catalyst at moderate temperature (45°C) and pressure (25-30 psia). Pesticide products that contain 1,2-dichloropropane were distillates of the chlorination of propylene (IARC 1986). However, Dow discontinued production of 1,2-dichloropropane for agricultural use, and pesticidal formulations containing this chemical, such as D-D, are unavailable in the U.S. (Meister 1987). By 1983, 1,2-dichloropropane was no longer sold for consumer use in paint strippers, paint varnish, and furniture finish removers (EPA 1986c; Dow Chem. Co. 1983). This indicates that production for sale, as opposed to internal consumption by manufacturers, has been greatly curtailed in the early 1980s.

4.2 IMPORT

Mobay Corporation imported 1 million lbs of 1,2-dichloropropane from the German Federal Republic in 1986 (EPA 1987c). Mobay currently imports 1,2-dichloropropane from the German Federal Republic on an as-need basis on customer's request. Other data pertaining to the import of 1,2-dichloropropane were not located in available literature.

4.3 USE

Based on 1982 production data supplied by Dow (EPA 1986c), it has been estimated that over 95% of the isolated product manufactured by Dow Chemical is used on-site as a captive intermediate in the production of perchloroethylene and other chlorinated products by their 'per-tet' process (EPA 1986c, Dow Chem. Co. 1983). Approximately 3 million pounds per year of dichloropropane was marketed by Dow Chemical in 1982 for use as an industrial solvent for oils, fats, resins, waxes, and rubber, in ion exchange manufacture, in toluene diisocyanate (TDI) production, in photographic film manufacture, for paper coating, and for petroleum catalyst regeneration (HSDB 1988; IARC 1986; EPA 1986c). As of 1982, Dow Chemical no

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longer sold 1,2-dichloropropane for use as a solvent in paint strippers, paint, varnish, and furniture finish removers as a low-cost alternative to methylene chloride. It had been a component of 10 of these products (EPA 1986c). By the end of 1983, its use as a solvent for film production was to be phased out in favor of 1,1,1-trichloroethane (Dow 1983). According to Dow (1989), the phaseout of use of 1,2-dichloropropane as a solvent for film production had not occurred as of June, 1989, although it is still planned. They further stated that the use of 34% in TDI production has now been discontinued. Outside of its use as a chemical intermediate, Dow Chemical Company's use pattern for 1,2-dichloropropane in 1982 was 41% in ion exchange manufacturing, 34% in toluene diisocyanate (TDI) production, 19% in photographic film production, 4% in paper coating, and 2% in petroleum catalyst regeneration (Dow 1983).

An estimated 20 million pounds/year of dichloropropane were produced as a by-product in a mixture marketed as a soil fumigant which had been used in the cultivation of a variety of crops, including citrus fruits, pineapple, soya beans, cotton, tomatoes, and potatoes (IARC 1986; HSDB 1988). Dow has discontinued production of soil fumigants containing 1,2-dichloropropane, and pesticidal formulations containing this chemical are no longer available in the U.S. (Meister 1987). Other uses for 1,2-dichloropropane include an intermediate in the synthesis of carbon tetrachloride, lead scavenger in gasoline, textile stain remover, oil and paraffin extractant, scouring compound, and metal degreasing agent, especially prior to electroplating (IARC 1986). However, the largest manufacturer of 1,2-dichloropropane, Dow Chemical Co. (1989), is not aware of its current uses as a lead scavenger in gasoline, textiles, stain remover, oil and paraffin extractant, scouring compound, and metal degreasing agent.

4.4 DISPOSAL

Incineration under controlled conditions appears to be the most viable method of disposal for 1,2-dichloropropane (OHM-TADS 1988; HSDB 1988). It is reported that Dow Chemical incinerates 7 million pounds of 1,2-dichloropropane annually (EPA 1986c). Disposal through the use of a liquid injection incinerator requires a temperature range of 650 to 1600°C and residence time of 0.1 to 2 seconds. A rotary kiln incinerator requires a temperature range of 820 to 1600°C and a residence time of seconds. A fluidized bed incinerator requires a temperature range of 450 to 980°C and a residence time of seconds (HSDB 1988). Where land disposal of waste residue containing 1,2-dichloropropane is sought, environmental regulatory agencies should be consulted on acceptable disposal practices (HSDB 1988). 1,2-Dichloropropane may also be a constituent of wastewater streams where it would be susceptible to removal by air stripping (EPA 1986c).

4.5 ADEQUACY OF THE DATABASE

Section 104 (i) (5) of CERCLA, directs the Administrator of ATSDR (in consultation with the Administrator of EPA and agencies and programs of the

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Public Health Service) to assess whether adequate information on the health effects of 1,2-dichloropropane is available. Where adequate information is not available, ATSDR, in cooperation with the National Toxicology Program (NTP), is required to assure the initiation of a program of research designed to determine these health effects (and techniques for developing methods to determine such health effects). The following discussion highlights the availability, or absence, of exposure and toxicity information applicable to human health assessment. A statement of the relevance of identified data needs is also included. In a separate effort, ATSDR, in collaboration with NTP and EPA, will prioritize data needs across chemicals that have been profiled.

4.5.1 Data Needs

Production, Import, Use, and Disposal. Production methods for 1,2-dichloropropane are described in the literature. While former major uses of 1,2-dichloropropane are known, there has been a phasing out of many of the applications with the greatest potential for population exposure. Current information concerning production volume and use is lacking. This type of information is absolutely necessary for estimating the potential for environmental releases from various industries, as well as potential concentrations in the environmental. Knowledge of what consumer products contain 1,2-dichloropropane is essential for estimating general population exposure. Unfortunately, this type of information is difficult to obtain in detail since companies consider it to be confidential business information. According to the Emergency Planning and Community Right to Know Act of 1986 (EPCRTKA), (§313), (Pub. L. 99-499, Title III, §313), industries are required to submit release information to the EPA. The Toxic Release Inventory (TRI), which contains release information for 1987, became available in May of 1989. This database will be updated yearly and should provide a more reliable estimate of industrial production and emission.

