

4 . PRODUCTION, IMPORT, USE, AND DISPOSAL

4.1 PRODUCTION

1,1,2-Trichloroethane is produced by Dow Chemical U.S.A. in Freeport, TX and by Olin Corporation in Seward, IL (SRI 1988). No production figures are available. It is produced in the U.S. from ethylene. In one method of preparation, ethylene is chlorinated to give 1,2-dichloroethane, which is then reacted with chlorine to give 1,1,2-trichloroethane (Archer 1979). A second method is via the oxychlorination of ethylene with hydrogen chloride and oxygen at 280-37°C in the presence of a catalyst (Archer 1979). 1,2-Dichloroethane and higher chlorinated ethanes are also formed in this process. 1,1,2-Trichloroethane is also produced as a coproduct in the thermal chlorination of 1,1-dichloroethane to produce 1,1,1-trichloroethane, especially when the reaction is carried out in the liquid phase (Archer 1979).

The only information pertaining to the amount of 1,1,2-trichloroethane produced dates back to 1979, when it was estimated that approximately 412 million pounds were produced (Thomas et al. 1982). This figure is the quantity of 1,1,2-trichloroethane required for maximum potential production of 1,1-dichloroethene (vinylidene chloride) and may be an overestimate because 1,1-dichloroethene can also be produced from 1,1,1-trichloroethane (Thomas et al. 1982). The exact quantity manufactured is proprietary information of Dow Chemical Corporation, who was the sole producer of 1,1,2-trichloroethane at that time. Most of the chemical was captively consumed as a precursor for 1,1-dichloroethene, however according to a spokesperson from Dow a quantity said to be in the 'low millions of pounds' is used annually in other industries (Thomas et al. 1982). It is not known whether the consumption of 1,1,2-trichloroethane has changed appreciably since 1979.

1,1,2-Trichloroethane is sometimes present as an impurity in commercial samples of 1,1,1-trichloroethane and trichloroethylene (Henschler et al. 1980; Tsuruta et al. 1983). 1,1,2-Trichloroethane has been shown to be formed during the anaerobic biodegradation of 1,1,2,2-tetrachloroethane; anaerobic conditions may occur in groundwater or in landfills (Bouwer and McCarty 1983; Hallen et al. 1986).

4.2 IMPORT

Data pertaining to the import of 1,1,2-trichloroethane were not located in the available literature.

4.3 USE

The principal use of 1,1,2-trichloroethane is as a chemical intermediate in the production of 1,1-dichloroethene (Archer 1979). There is no information available on the uses of the 'low millions of pounds' that were said to have been sold to other industries by Dow Chemical.

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1,1,2-Trichloroethane finds limited use as a solvent where its high solvency is needed, such as for chlorinated rubbers (Archer 1979). It may be used as a solvent for fats, oils, waxes, and resins (Hawley 1981). Some 1,1,2-trichloroethane was sold for use in consumer products (Thomas et al. 1982). There was no indication in the literature as to what these products were. Moolenaar and Olson (1989), in a written communication as spokesmen for the Dow Chemical Company, a major producer of 1,1,2-trichloroethane, however, stated that they are not aware of any consumer uses and that the Dow Chemical Company screens potential customers to determine how they intend to use it.

4.4 DISPOSAL

1,1,2-Trichloroethane has been disposed of by adsorption on a suitable sorbent such as vermiculite, dry sand, or earth and placement in a secure landfill (NLM 1988). This method is not recommended, however (NLM 1988), although no alternative method was discussed in the available literature. The method of disposal recommended for most chlorinated solvents is incineration.

4.5 ADEQUACY OF THE DATABASE

4.5.1 Data Needs

Data on current production and use of 1,1,2-trichloroethane are completely inadequate. Information is especially needed on the commercial uses of 1,1,2-trichloroethane and what types of consumer products, if any, contain this chemical. This information is essential for estimating exposure to 1,1,2-trichloroethane and for determining which groups in the population are occupationally or generally exposed. 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.