



trans-1,2-DICHLOROETHYLENE

FACT SHEET ON A DRINKING WATER CHEMICAL CONTAMINANT

GENERAL INFORMATION

Synonyms:

- 1,2-DCE; trans-1,2-DCE; 1,2-Dichloroethene; Acetylene Dichloride; sym-Dichloroethylene

Chemical Description:

- A volatile synthetic compound with no known natural sources
- Usually found in the form of a mixture of both the cis- and trans- isomers (cis-1,2-DCE and trans-1,2-DCE)

Properties:

- A clear, colorless, flammable liquid
- Relatively high vapor pressure
- Moderately soluble in water

Production and Use:

- Used primarily as a captive intermediate in the production of other chlorinated solvents, and as an extraction solvent for meat and fish oils and fats

ENVIRONMENTAL PROFILE

Occurrence:

- Major source of exposure is from contaminated water except in areas near production sites where air exposures may dominate
- Monitoring studies have found that both the cis- and trans- isomers occur as widespread low level contaminants of ground water, and occur in surface waters at even lower amounts
- The cis- isomer is reported to occur in drinking water at higher levels than the trans- isomer
- Co-occurs with trichloroethylene
- Both isomers (especially the cis- isomer) have been identified as degradation products of trichloroethylene and tetrachloroethylene

Releases:

- Releases to the environment are expected to be small, with the majority of releases emanating from manufacturing plants in the Gulf Region of the U.S

Environmental Fate:

- Little direct information, but the behavior of the compounds has been extrapolated from information on similar chlorinated compounds:
 - **Released to the atmosphere:** expected to chemically degrade in a matter of hours
 - **Released to surface waters:** slightly persistent in water; expected to volatilize rapidly to air (major route of removal); chemically stable in water, but may biodegrade to vinyl chloride in some ground waters; not likely adsorb to suspended solids or sediment
 - **Released to soil:** will not adsorb strongly to soils (moderately mobile in soils) with moderate potential to migrate to ground waters; will volatilize to the atmosphere from soil surface
- Low potential for bioaccumulation

HEALTH EFFECTS

Humans:

- At high concentrations, the dichloroethylenes, like other chlorinated ethylenes, possess anesthetic properties
- The trans- isomer is approximately twice as potent as the cis- isomer in its ability to depress the central nervous system (CNS)

Experimental Animals:

- Short-term, high doses can cause narcosis and death in rats in four hours
- Long-term, high doses cause degenerative effects upon the liver, and the circulatory and immunological systems
- Non-mutagenic
- No information found in the available literature on the teratogenic, fetotoxic, or carcinogenic potential trans-1,2-DCE

REGULATORY PROFILE

Existing Standards:

- **Clean Air Act (CAA):** Not regulated
- **Clean Water Act (CWA):**
Criteria established
- **Resource Conservation and Recovery Act (RCRA):**
Hazardous waste
- **Superfund (CERCLA):**
 - Hazardous substance
 - **SARA:** Toxic chemical
- **Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA):**
Not registered
- **Toxic Substances Control Act (TSCA):**
Not regulated

HEALTH INFORMATION

Maximum Contaminant Level Goals (MCLG):

- Non-enforceable levels based solely on an evaluation of possible health risks and exposure, and taking into consideration a margin for public safety
- Set at 0.1 mg/L to protect against damage to the liver, and circulatory and nervous systems

MCLG for trans-1,2-DCE = 0.1 mg/L
(effective July 1992)

Maximum Contaminant Levels (MCL):

- Legally enforceable levels for contaminants in public drinking water supplies
- Based on health risks associated with the contaminants, analytical methods for their assay, and water treatment feasibility and practicality aspects
- Exceedance of the MCL in drinking water may result in adverse effects which will depend upon the contaminant concentration in water, amount of water/contaminant ingested, length of exposure, and other biological parameters

MCL for trans-1,2-DCE = 0.1 mg/L
(effective July 1992)

EPA Health Advisories (HA):

- **Short-term HAs:** Provide acceptable concentrations of contaminants in water for up to 10 day exposures, primarily to evaluate the public health risk resulting from an accidental spill or an emergency contamination situation
- **Longer-term HAs:** Provide guidance for persistent water contamination situations to cover a period of up to 7 years
- **Lifetime HAs:** Derived in the same way as an MCLG

Health Advisories

Short-term HA for a child = 2.0 mg/L

Longer-term HA for a child = 2.0 mg/L

Longer-term HA for an adult = 6.0 mg/L

Lifetime HA = 0.01 mg/L

ANALYTICAL METHODS

- Purge and Trap Gas Chromatography:
EPA Method 502.1
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- Purge and Trap Column Gas Chromatography with Photoionization and Electrolytic Conductivity Detectors in Series:
EPA Method 502.2
- Purged Column Gas Chromatography/Mass Spectrometry:
EPA Method 524.1
- Capillary Column Gas Chromatography/Mass Spectrometry:
EPA Method 524.2

WATER TREATMENT

Permanent Treatment:

- **Best Available Technology (BAT):**
 - Granular Activated Carbon
 - Packed Tower Aeration

SHORT-TERM HAZARD ELIMINATION

- If the drinking water standards are exceeded, install BAT or use an alternative drinking water supply such as bottled water

ADDITIONAL HELP

- State or county health officials can indicate a certified laboratory for testing
- Experts in the state Department of Environmental Protection or Natural Resources may also be of help
- The EPA has toll-free numbers for further information on drinking water quality, treatment technologies, for obtaining Health Advisories, and for other regulatory information
- EPA Hotlines are available Monday through Friday
 - **Safe Drinking Water:** 800-426-4791
 - **National Pesticides:** 800-858-7378
 - **Superfund/RCRA:** 800-424-9346
- For information on the Clean Water Act, call (202) 260-7301
- For information on the Toxic Substances Control Act, call (202) 554-1404
- For information on the Clean Air Act, call (919) 541-2777