CARBON TETRACHLORIDE

FACT SHEET ON A DRINKING WATER CHEMICAL CONTAMINANT

GENERAL INFORMATION

Synonyms:
- CCl_4; Methane Tetrachloride; Tetrachloromethane; Perchloroethane

Chemical Description:
- Synthetic organic compound; no natural sources

Properties:
- Clear, highly volatile liquid
- Non-flammable
- Limited solubility in water, soluble in most organic solvents
- Boiling point, 76.5°C

Production and Use:
- Production in 1983 was about 600 million pounds
- Also produced as a by-product of the manufacturing of chlorinated materials
- Major use is in production of chlorofluorocarbons; also used in fumigants, metal cleaners, and manufacturing of paints and plastics

ENVIRONMENTAL PROFILE

Occurrence:
- Ubiquitous in air at concentrations less than 10 parts per trillion; rarely found in surface water
- EPA estimates less than 1% of ground water used for drinking water contains CCl_4 at concentrations greater than 0.5 µg/L
- No information available on CCl_4 concentration in food; CCl_4 was largely replaced in 1980 as a grain fumigant

Releases:
- Enters the environment, primarily by evaporation from accidential releases, from production and use areas, or during disposal in landfills or surface water

Environmental Fate:
- Half life 70,000 years in water, 30-100 years in atmosphere
- Stable, slightly heavier than water, migrates readily in soil
- Evaporates from surface water to atmosphere within a few days or weeks
- Does not bioaccumulate in individual animals or food chains

HEALTH EFFECTS

Humans:
- Causes liver, kidney, and lung damage, central nervous system depression, and death
- Data are inadequate to categorically state that CCl_4 is a human carcinogen; however, there is ample animal data to classify CCl_4 as a group B2 carcinogen, a probable human carcinogen

Experimental Animals:
- Single oral doses in rats or mice—adverse liver, kidney, and lung effects
- Long-term oral exposure, 12 weeks in rats—adverse liver effects
- No reproductive effects reported; no developmental effects studies located
- Induces liver cell proliferation in *in vivo* and *in vitro* assays and is weakly mutagenic in some cell lines
- High doses of CCl_4 for 6 months or longer in rats, mice, and hamsters—liver tumors

REGULATORY HISTORY

Existing Standards:
- **Clean Air Act (CAA):** Registered
- **Clean Water Act (CWA):** Reportable Quantity under 10 pounds
- **SDWA:** Registered
- **Resource Conservation and Recovery Act (RCRA):** Listed
- **Superfund (CERCLA):** Reportable Quantity 5,000 pounds
- **SARA:** Listed
- **Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA):** Banned for use as a fumigant
- **Toxic Substances Control Act (TSCA):** On Inventory

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 zero for cancer-causing chemicals in water

MCLG for CCl_4 = 0 mg/L

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

MCL for CCl_4 = 0.005 mg/L (adopted 7/8/87)

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 = 0.16 mg/L
Longer-term HA for a child = 0.071 mg/L
Longer-term HA for an adult = 0.25 mg/L

ANALYTICAL METHODS

- Gas chromatography
  EPA Method 502

WATER TREATMENT

Permanent Treatment:

Best Available Technology (BAT):

- granular activated carbon adsorption
- aeration
- boiling
- air stripping

SHORT-TERM HAZARD ELIMINATION

- If the drinking water standards are exceeded, install BAT or use an alternative drinking water supply such as bottled water
- Boiling water for 5 minutes may remove as much as 99% of CCl_4 present, but CCl_4 is not degraded—potential inhalation hazard

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, 8:30 a.m. to 4:30 p.m. EST:

•Safe Drinking Water:	**800-426-4791**
•Air Quality:	**800-631-2700**
•National Pesticides:	**800-858-PEST**
•Superfund/RCRA:	**800-424-9346**
	800-343-3958

- For information on the Clean Water Act, call (202) 260-7301
- For information on the Toxic Substances Control Act, call (202) 554-1404