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Chlorinated Solvents

Chlorine is commonly used for industrial purposes in the form of compounds known as **chlorinated solvents**. Chlorinated solvents, primarily used as cleaning agents, are particularly attractive because they are effective at removing soils, fats, oils, and greases from metals. In addition, they are nonflammable, noncorrosive, and chemically stable.

However, chlorinated solvents are also responsible for the contamination of groundwater supplies as a result of spills or improper disposal practices. Some chlorinated solvents, such as CFC–113 and 1,1,1-trichloromethane (TCA), are stratospheric ozone–depleting chemicals. Other solvents, such as perchloroethylene (PCE) and trichloroethylene (TCE), are considered potential **carcinogens**.

A Closer Look at a Few Chlorinated Hydrocarbon Solvents:

Chemical	TCA 1,1,1-trichloromethane (methyl chloroform)	TCE trichloroethylene	PCE perchloroethylene (perc) (tetra-chloroethylene)
Characteristics	Nonflammable Colorless liquid Slightly soluble in water	Low flammability Colorless liquid Slightly soluble in water	Nonflammable, nonexplosive, clear liquid Nonsoluble in water
Uses	Metal and plastic cleaning agent, chemical intermediate, coolant	Dry cleaning, chemical intermediate, metal cleaning, and degreasing	Dry cleaning, chemical intermediate, metal cleaning and degreasing
Potential Health Effects from Overexposure	Skin, eye, mucous membrane, and respiratory tract irritant, central nervous system depressant At 1,000 ppm: no response At 2,000 ppm: loss of coordination	Acute effects: lightheadedness, drowsiness, headaches; respiratory tract, eye, skin irritant Chronic effects: damage to liver and kidneys	At 200 ppm: nose and eye irritation At 400 ppm: dizziness, loss of coordination Over 1,500 ppm: unconsciousness
Potential Environmental Effects	Stratospheric ozone depletion (*production* phased out by 1/96, though *use* still allowed)	Groundwater pollution	Wastewater containing perc is considered a hazardous waste Designated as a hazardous air pollutant
Routes of Exposure	Inhalation, skin absorption, ingestion	Inhalation, skin absorption, ingestion	Inhalation, skin absorption, ingestion
Source of Exposure	Occupational	Occupational, spill	Occupational, spill

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