

Oregon Department of Human Services

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TECHNICAL BULLETIN

HEALTH EFFECTS INFORMATION

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Department of Human Services
ENVIRONMENTAL TOXICOLOGY SECTION
Office of Environmental Public Health
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(1,2-DCA)
1, 2 Dichloroethane

For More Information Contact:

Environmental Toxicology Section
(971) 673-0440

Drinking Water Section
(971) 673-0405

SYNONYMS

1,2-Ethylene dichloride; Dichloroethylene; Ethylene Dichloride; Dichloroethane; alpha, beta-Dichloroethane; symmetrical (sym-) Dichloroethane; 1,2-DCA (DO NOT CONFUSE WITH 1,1-DCA OR WITH OTHER CHEMICAL NAMES ENDING WITH "ENE" OR "YLENE".)

USES

1,2-DCA has been used widely as a solvent in industrial cleaners, as a gasoline additive, in household cleaners and pesticides; and as a solvent in glues, paints and varnishes. At the present time it is mainly used in industry for manufacturing other compounds such as polyvinyl chloride products.

CHEMICAL AND PHYSICAL PROPERTIES

Molecular formula $C_2H_4Cl_2$. 1,2-DCA is a man-made compound that does not occur in nature. In concentrated form it is a clear, sweet-smelling liquid with a very high evaporation rate at normal temperatures. In water it can be detected by odor at about 20 ppm, and in air at concentrations of 10-50 ppm.

WHERE DOES IT COME FROM? HOW DOES IT ENTER THE ENVIRONMENT?

1,2-DCA occurs only as a manmade product and it enters air, water and soils by spills, as a component of waste materials, as a contaminant of industrial and sewage wastes, and by evaporation into the air.

WHAT HAPPENS TO IT? WHAT IS ITS ENVIRONMENTAL FATE?

Because of its high evaporation rate, most released 1,2-DCA evaporates into the air where it is diluted and carried long distances. In the atmosphere the sun, ozone and oxygen break it down to smaller nontoxic byproducts. Spills on surfaces or on the soil generally evaporate quickly unless the material leaches into deeper, cooler soil layers where it becomes a serious groundwater threat. In surface water the compound also decomposes and evaporates, but more slowly than in air. If the compound reaches deeper soils or groundwater where it does not break down, it can travel long distances without decomposing and can enter drinking water wells.

HOW CAN 1,2-DCA ENTER AND LEAVE MY BODY?

Exposure to animals and human beings generally occurs by ingestion as a contaminant of food, water or other beverages; and by inhalation of vapor from the air. Persons who use products containing 1,2-DCA in the home or in the work place may also absorb significant amounts through their skin. It is absorbed into the blood and travels throughout the body. In a matter of 1-2 days it is eliminated from the body by excretion through urine and exhaled through the lungs.

WHAT ARE ITS HARMFUL EFFECTS?

1,2-DCA, when at high levels in the body, is known to harm kidneys, liver, nerves and brain tissue. Very high exposure can cause cancer in animals. Injury generally occurs at levels much higher than normal, but public health and medical professionals recommend keeping exposure as low as possible. EPA currently classifies 1,2-DCA as a "probable human carcinogen."

DRINKING WATER STANDARDS

The USEPA has established a Maximum Contaminant Level (MCL) for 1,2-DCA in public drinking water. The current MCL is 0.005 mg/l (ppm). Drinking water containing 1,2-DCA at or below this level is believed to pose little or no risk for any domestic use.

CAN 1,2-DCA BE REMOVED FROM DRINKING WATER?

Treatment methods that will remove or reduce levels of 1,2-DCA in water include aeration, heating or boiling. These methods transfer the compound to the air, and should not be used unless adequate ventilation or other precautions are taken to prevent inhalation. Activated charcoal filtration will also remove or reduce the amount of the compound in water. No one treatment method is able to remove all harmful substances from water. There are limitations, advantages and disadvantages to inhouse as well as large-scale treatment processes. Before deciding on the need for water treatment, more information should be obtained from the Department of Human Services Drinking Water Section at (971)-673-0405.