



Epichlorohydrin

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CAS number 106-89-8

Epichlorohydrin is colorless liquid, insoluble in water. Its vapor is explosive when mixed with air. It has a sweet, pungent or chloroform-like odor.

Usage and exposure

Epichlorohydrin is a major raw material for epoxy and phenoxy resins, and is used in the manufacture of glycerin, in curing propylene-based rubbers, as a solvent for cellulose esters and ethers, and in resins with high wet-strength for the paper industry [IARC].

The primary use of epichlorohydrin is in the production of epoxy resins used in coatings, adhesives, and plastics [EPA].

Epichlorohydrin is used in the manufacture of synthetic glycerin, textiles, paper, inks and dyes, solvents, surfactants, and pharmaceuticals [EPA].

Epichlorohydrin is also listed as an inert ingredient in commercial pesticides [EPA].

Individuals are most likely to be exposed to epichlorohydrin in the workplace.

Epichlorohydrin may be released to the ambient air during its production and use.

Accidental releases to waterways may expose the general public to epichlorohydrin [EPA].

Occupational exposures to epichlorohydrin may occur in its use as a solvent and in resin production and use, the manufacture of glycerine and use of propylene-based rubbers. It has been detected at low levels in water [IARC].

Routs of exposure

Respiratory system, skin, eyes, gastrointestinal system.

Target organs

Respiratory system, skin, eyes, gastrointestinal system.

Metabolism and Health hazards

Acute effects

Acute [short-term] inhalation exposure to epichlorohydrin in the workplace has caused irritation respiratory tract .Also it causes irritation to the eyes, and skin of workers. At high levels of exposure, nausea, vomiting, cough, labored breathing, inflammation of the lung, pulmonary edema, and renal lesions may be observed in humans [EPA].

Skin exposure causes redness, burning sensation, serious skin burns, pain, blisters.

It may cause pain and redness of eyes, severe deep burns.

Ingestion of epichlorohydrin causes abdominal cramps, burning sensation in the throat and chest, diarrhea, headache, nausea, sore throat, vomiting, shock or collapse [CDC].

Chronic effects

Chronic (long-term) occupational exposure of humans to epichlorohydrin in air is associated with high levels of respiratory tract illness and hematological effects. Dermal contact with epichlorohydrin may result in irritation and burns of the skin in humans [EPA].

In humans occupationally exposed to epichlorohydrin, effects on sperm counts, hormone levels, and fertility have been not detected [EPA].

The results of some studies showed no detrimental effect on fertility due to exposure to epichlorohydrin [IARC].

The risk of cancer has been investigated among population exposed to epichlorohydrin. There is inadequate evidence in humans for the carcinogenicity of epichlorohydrin. There is sufficient evidence in experimental animals for the carcinogenicity of epichlorohydrin.

The researches took into consideration the known chemical reactivity of epichlorohydrin and its direct activity in a wide range of genetic tests. Epichlorohydrin is probably carcinogenic to humans (Group 2A). [IARC].

References

1. CDC. Centers for Disease Control and Prevention. The National Institute for Occupational Safety and Health (NIOSH). Epichlorohydrin. <<https://www.cdc.gov/niosh/ipcsneng/neng0043.html>>. Accessed 05/10/2018.
2. EPA. U.S. Environmental Protection Agency. Epichlorohydrin (1-Chloro-2,3-Epoxypropane), 106-89-8. <<https://www.epa.gov/sites/production/files/2016-09/documents/epichlorohydrin.pdf>>. Accessed 05/10/2018.

3. IARC. Re-evaluation of Some Organic Chemicals, Hydrazine and Hydrogen Peroxide. Volume71, pp: 603-629.