VINYL CHLORIDE

Overview

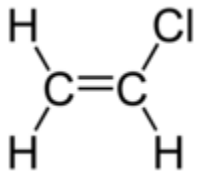
Vinyl chloride is a flammable and colorless gas with a mildly sweet odor. It can be formed when other substances such as trichloroethane and Trichloroethylene are broken down. It is used to make polyvinyl chloride (PVC) plastic and vinyl products. Exposure to vinyl chloride occurs mainly in the workplace. (#ATSDR) Acute exposure to high levels of vinyl chloride in air has resulted in central nervous system effects in humans. Chronic exposure to vinyl chloride through inhalation and oral exposure in humans has resulted in liver damage. Vinyl chloride exposure has been shown to increase the risk of a rare form of liver cancer in humans (#EPA).

Just the facts

Physical Information
Name: Vinyl Chloride
Use: manufacture of polyvinyl chloride (PVC); small amounts used in furniture, automobile upholstery, wall coverings, housewares, and automotive parts
Source: exhaust gases from factories processing vinyl chloride, outgas inside new cars from new plastic parts, drinking water in contact with polyvinyl pipes
Recommended daily intake: none
Absorption: oral, dermal, inhalation
Sensitive individuals: humans and animals

Physical Information
Toxicity/symptoms: eye and respiratory tract irritation, CNS and PNS effects
Regulatory facts: EPA: </=0.002 mg/L drinking water; OSHA: 1ppm air; FDA: vinyl chloride content in plastics depend on nature of plastics and its use
General facts:
Environmental:
Recommendations:

Chemical Structure



Structure retrieved from *Answers.com*

Chemical Description

Vinyl chloride is a flammable and colorless gas with a mildly sweet odor. It is unstable at high temperatures and can be formed when other substances such as trichloroethane and Trichloroethylene are broken down. (#ATSDR)

Metabolism

Vinyl chloride is mainly transformed in the liver via the mixed function oxidase system. The alcohol dehydrogenase system and the catalase system may also be involved.

Vinyl chloride is first metabolised to chloroethylene oxide, then it is transformed into chloroacetaldehyde, which is further converted to chloroethanol or monochloroacetic acid. Chloroethylene oxide, chloroacetaldehyde and monochloroacetic acid are the main toxic metabolites of vinyl chloride (#Inchem.org).

Uses

Vinyl chloride is used to make polyvinyle chloride (PVC) plastics products such as pipes, wire and cable coatings, and packaging materials. Vinyl chloride is also used in furniture and automobile upholstery, wall coverings, housewares, and automotive parts. (#EPA)

Health Effects

Acute Effects: High levels of acute exposure via inhalation affects human central nervous system causing:

* dizziness
* drowsiness
* headaches
* giddiness

It could also be slightly irritating to human eyes and respiratory tract. Extremely high levels of vinyl chloride exposure causes loss of consciousness, lung and kidney irritation, and inhibition of blood clotting in humans and cardiac arrythmias in animals (#EPA).

Chronic Effects: Chronis exposure of humans via inhalation and oral exposure may cause liver damage. Central nervous system effects (such as dizziness, drowsiness, fatigue, headache, memory loss) and peripheral nervous system effects (such as peripheral neuropathy, tingling, numbness, weakness and pain in fingers) have been reported by humans exposed to vinyl chloride in the workplace (#EPA).

History

Vinyl Chloride is a widely used industrial chemical used to produce its polymer, [polyvinyl cholide (PVC)|PVC]. In 1912 [Fritz Klatte], a German chemist, patented a means to produce vinyl chloride. He would treat [acetyline] and [hydrogen chloride] with [mercury chloride]. This process was again supplanted by more economical means.

Source : http://www.toxipedia.org/display/toxipedia/Vinyl+Chloride