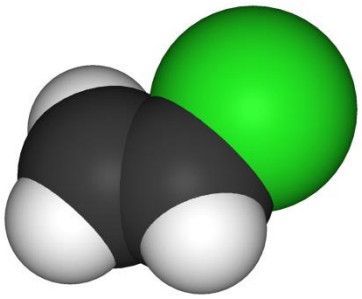
# Laboratory Safety Bulletin

Phone: 519-253-3000 Ext. 3523 • E-mail: ccc@uwindsor.ca • Web: www.uwindsor.ca/ccc
Location: Essex Hall / B-37 • Hours: 8:30 am to 4:30 pm (M-F)

## DESIGNATED SUBSTANCE: VINYL CHLORIDE

### What is Vinyl Chloride?

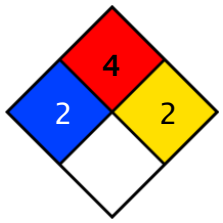


Vinyl chloride is a synthetic chemical with no known natural sources. It is a colorless gas manufactured almost exclusively for use in the production of polyvinyl chloride (PVC). At ambient temperature vinyl chloride is an extremely flammable and potentially explosive gas that is heavier than air. It has a mild, sweet odor, but odor is not an adequate warning of hazardous concentrations. When confined under high pressure in special containers, vinyl chloride exists in a liquefied state. It is shipped and handled this way. Vinyl chloride is easily polymerized and copolymerized with various materials such as acrylonitrile, vinyl acetate, and styrene, to form pliable, lightweight plastics or thermoplastic resins. Vinyl chloride is very toxic to humans.

### Hazard Classification – Vinyl Chloride

**WHMIS**

**NFPA**




Health: 2
Flammability: 4
Reactivity: 2
Specific:

### How can Vinyl Chloride affect your body?

The immediate health effects of inhaling vinyl chloride are sleepiness, dizziness, and loss of consciousness. Loss of consciousness can occur from exposure to concentrations such as 25 g/m$^3$. If pressurized liquid vinyl chloride escapes from its container and comes in contact with the skin or eyes it can cause frostbite or irritation. Acute exposure to high concentrations in air also causes central nervous system depression in humans, with symptoms of dizziness, nausea, headache, irritability, poor memory, tingling sensations, weight loss, irritation of the respiratory tract and chronic bronchitis. The target organs of vinyl chloride include the liver, brain and the lung, and probably the lymph hematopoietic system. Vinyl chloride is well known human and animal carcinogen. Mutagenicity studies in both man and in test organisms clearly demonstrated positive mutagenic activity of vinyl chloride.

### How do you work safely with Vinyl Chloride?

Vinyl chloride is extremely flammable, very toxic, and dangerously reactive. Only properly trained laboratory personnel may handling this chemical. Closed handling systems for processes involving vinyl chloride should be used. If closed handling systems are not possible, use the smallest amounts possible in an efficient fume hood.

If engineering controls and work practices are not effective in controlling exposure to vinyl chloride, then wear suitable personal protection equipment, including approved respiratory protection. Unprotected persons should avoid all contact with this chemical including contaminated equipment.

While handling, eliminate all ignition sources such as sparks, open flames, hot surfaces and prevent exposure to elevated temperatures and absolutely no contact with even trace amounts of incompatible materials, such as oxidizing agents. Vinyl chloride self-polymerizes explosively if heated, exposed to sunlight, or mixed with air and contaminants. Additionally avoid contact with aluminum, copper, iron, and steel. Metal fittings containing copper, silver, mercury and magnesium should not be used with vinyl chloride as they are capable of detonating vinyl chloride vapor. Keep self contained breathing apparatus readily available for emergency use.

## First Aid Procedures:

**Skin & Eye Contact:** Quickly remove victim to an uncontaminated area and flush infected area with lukewarm, gently flowing water. Do not rub area or apply heat. Carefully cut around clothing that sticks to the skin and discard in a waste plastic pail. Cover the infected area with sterile clothing. Quickly seek medical attention. Bring any contaminated clothing inside of a sealed plastic container to the Chemical Control Centre for disposal.

**Inhalation:** Bring the victim to an uncontaminated area to inhale fresh air and seek medical attention immediately. Quick removal from the contaminated area is most important. Unconscious persons should be moved to an uncontaminated area, given assisted respiration and supplemental oxygen. Further treatment should be symptomatic and supportive while waiting for medical attention.

## Where do you store Vinyl Chloride and its empty containers?

Vinyl chloride comes in the form of a compressed gas. Protect cylinder from physical damage and store in cool, dry, well-ventilated area of noncombustible construction away from heavily trafficked areas and emergency exits. Do not allow the temperature where cylinder is stored to exceed 52ºC. Cylinders should be stored upright and firmly secured to prevent falling or being knocked over. Empty cylinders should be returned to the CCC. "No Smoking or Open Flames" signs should be posted in the storage or use area. When the gas is in service, the gas cylinder must be secured to a wall or a fixed object.

## What are the steps to follow if Vinyl Chloride is released to the atmosphere?

If safe to do so, prevent the spill from spreading, do not touch spilled material and then immediately evacuate the area. Contact Campus Police by dialing 911 from a campus phone. The cleanup of a spill of vinyl chloride should only be conducted by the trained personal wearing adequate personal protective equipments.

This lab safety bulletin is not a complete source on the safe handling of vinyl chloride at the University of Windsor. You should always check the SDS of vinyl chloride at www.uwindsor.ca/msds before you work.

For more information on vinyl chloride please, visit the Chemical Control Centre's University of Windsor Designated Substance Program at www.uwindsor.ca/ccc or contact the CCC by phone (ext. 3523).

For more information on spills please see the University of Windsor's Spill Response Manual at www.uwindsor.ca/ccc.

**References:**


1. Cheminfo, *Chemical Profile – Vinyl Chloride,* Canadian Centre for Occupational Health and Safety, Hamilton ON 2007.
2. *Hazardous Materials Spill Response Guidelines,* Chemical Control Centre, University of Windsor ON 2008.
3. http://msds.oxy.com/DWFiles/M9192_NA_EN%231.pdf