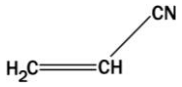
Laboratory Safety Bulletin

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: ACRYLONITRILE

What is so hazardous about Acrylonitrile?

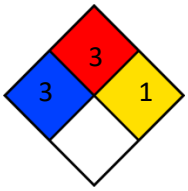
Acrylonitrile (2-propenenitrile) exists at room temperature as either a colorless or a slightly yellow liquid with a pungent smell. The liquid and vapor are extremely flammable. As a lachrymator, acrylonitrile causes the shedding of tears. It is a dangerously reactive chemical and can polymerize easily when heated. Technical grade acrylonitrile almost always contains a polymerization inhibitor, usually methylhydroquinone. At normal temperatures acrylonitrile is very volatile and forms high vapor concentrations that are hazardous to inhale. When inhaled, acrylonitrile forms toxic cyanides in the body. Acrylonitrile vapors are so dangerous that it is advised not to store this material for longer than 6 months. Acrylonitrile is used primarily as the starting monomer in the manufacturing of synthetic polymers, such as acrylic fabrics found in carpets.



Hazard Classification – Acrylonitrile

WHMIS

NFPA



Health: 3
Flammability: 3
Reactivity: 1
Specific:

How can Acrylonitrile affect your body?

Acrylonitrile is a serious inhalation hazard and may be fatal if inhaled. Common acute symptoms are headache, nausea, dizziness, vomiting and hallucinations. Prolonged exposure can result in tremors, discoloration of skin, convulsions and possible death. Acrylonitrile is very toxic and a severe irritant. If your hands come in contact with acrylonitrile after one day you may notice redness of your hands, after three days you may notice blistering of your fingers. Your skin may have an allergic reaction and become swollen, itchy and painful. Acrylonitrile is a possible cancer hazard as it causes cancer in animals.

How do you work safely with Acrylonitrile?

Acrylonitrile is a dangerous chemical and should only be handled by experienced, trained personnel. The vapors of acrylonitrile are toxic, extremely flammable and may explode when exposed to a heat source. To prevent the release of vapors in your workplace, work in a fume hood or a glove box and perform experiments under nitrogen (when available). Keep acrylonitrile away from heat and sunlight.

To protect yourself from personal contact with acrylonitrile, a laboratory coat, goggles and either a pair of butyl or viton/butyl rubber gloves must be worn at all times. You need to use appropriate respiratory protection for operating with this chemical outside of a fume hood. Promptly and appropriately dispose of excess acrylonitrile and do not return any unused chemical to the original container. Wash hands thoroughly after working with acrylonitrile.

Acrylonitrile polymerizes violently in the presence of a strong base, i.e. sodium hydroxide or amines and with a strong acids (i.e. nitric or sulfuric acid) undergoes a vigorous exothermic and violent reaction. Acrylonitrile may react violently and explode with strong oxidizing agents, i.e. nitrates or perchlorates. A halogen i.e. bromine or chlorine combined with acrylonitrile may cause a runaway exothermic reaction and violent polymerization.

First Aid Procedures:

Antidote: Amyl nitrite is an antidote to cyanide toxicity. Consult with a doctor to determine if using amyl nitrite as a first aid measure is appropriate and arrange for training of first aiders who may be required to administer the antidote.

Inhalation: Remove victim to fresh air. If breathing has stopped a trained personnel should begin artificial respiration or CPR if the heart has stopped. Avoid mouth to mouth contact. Seek medical attention if symptoms develop or persist.

Skin & Eye Contact: In case of skin or eye contact, as quickly as possible, flush with lukewarm water for 20 minutes or until the chemical is removed. Remove contaminated clothing under an emergency shower. Seek medical attention immediately.

Ingestion: Rinse victim's mouth with water. **DO NOT INDUCE VOMMITING**. Have victim drink 2cups of water. Seek medical attention immediately.

Where do you store Acrylonitrile and its empty containers?

Always store acrylonitrile in a cool dry area under nitrogen. Have fire extinguishers in storage and work areas. Store away from incompatible materials (see handling section). Label containers with the date received, date opened, and the return date. Do not store acrylonitrile for period longer than 6 months. At the return date, bring acrylonitrile to the Chemical Control Centre (CCC) for disposal. Empty containers may contain hazardous residues. Keep empty containers in a separate storage area or return them to the CCC for disposal.

What happens if Acrylonitrile is spilled?

If a small spill of acrylonitrile occurs inside a fume hood, wear appropriate personal protection equipment, remove all ignition sources and soak up the spill with the universal absorbent material located within the spill kit. Place material in a labeled container and bring to the CCC for disposal. Flush the spill area with water and ventilate after clean up. If a large spill occurs or a spill occurs outside a fume hood, evacuate the area immediately and contact the Campus Police by dialing 911 from any campus phone for assistance.

This lab safety bulletin is not a complete source on the safe handling of acrylonitrile at the University of Windsor. You should always check the SDS of your acrylonitrile containing product at www.uwindsor.ca/msds before you work.
For more information on acrylonitrile please visit the Chemical Control Centre's University of Windsor Designated Substance Program at www.uwindsor.ca/ccc or 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. *Acrylonitrile,* Material Safety Data Sheet, Sigma-Aldrich, Fluka – 10710, Oakville ON 2007.
2. Cheminfo (2007), *Chemical Profile – Silica, quarts,* Canadian Centre for Occupational Health and Safety, Retrieved April 19, 2007 from K:\Lab Safety\Designated Substances\Acylonitrile - Reg 835\CHEMINFO Acrylonitrile.htm
3. *Acrylonitrile - Designated Substances,* Chemical Control Centre, University of Windsor ON 2007.