ACRYLONITRILE

Scope

This document outlines the controls that should be used for low-risk use of acrylonitrile. In this context, low-risk use is defined as:

- Any quantity of acrylonitrile used in a fumehood or a nitrogen-regulated glovebox where the process **does not**:
  - Lead to the formation of vapours (e.g., heating, violent chemical reactions)
  - Include distillation

All other processes require that a Designated Substance Assessment is completed in conjunction with the Safety Office, as well as a standard operating procedure (SOP) that is approved by the supervisor, communicated to workers, and available in the lab.

Hazard Description

Acrylonitrile is a colourless to faint-yellow liquid with a strong, onion-like odour. Its a highly volatile, flammable, toxic carcinogen that targets the respiratory system. Its vapours are extremely toxic by ingestion, inhalation, and skin contact. See the Chemical Safety website for more resources on peroxide formers. Acrylonitrile is classified as a designated substance (Occupational Health and Safety Act, R.S.O. 1990, c. O.1, O. Reg. 490/09).

Prior to Working with Acrylonitrile

- Complete all mandatory training (refer to Chemical Safety Program and your project risk assessment).
- Complete a research-specific laboratory risk assessment to evaluate risk.
- Confirm that acrylonitrile cannot be substituted for a safer substance. For example, acetone and ethanol are common alternatives to acrylonitrile in chromatography.
- Storage and use of acrylonitrile requires the completion of the Designated Substance Form.
- Review any relevant SOPs for the equipment or techniques that may be performed with acrylonitrile.
- Ensure that all required materials are available in case of a spill, emergency, and for waste collection.
- Remove sources of ignition from the immediate area due to acrylonitrile's high flammability.

- Inspect the bottle for signs of peroxide formation:
  - If the bottle shows evidence of peroxides, do not use it; dispose of the acrylonitrile bottle through the hazardous waste facility.
  - If the bottle does not show evidence of peroxides, complete peroxide testing to confirm prior to use.

Handling

- **Always** handle acrylonitrile in a fumehood or a glovebox. Acrylonitrile should **never** be used outside of a fumehood or glovebox.
- Wear personal protective equipment as outlined in your laboratory risk assessment. At minimum, personal protective equipment should include gloves, chemical safety goggles, a lab coat, and close-toed boots. Suitable gloves for handling acrylonitrile are *Butyl* or *Viton/Butyl* rubber gloves. Nitrile gloves are not compatible with acrylonitrile and should **not** be used.
- Acrylonitrile must **never** be mixed with strong oxidizers (e.g., bromine, chlorine) or sodium hydroxide due to risk of explosion. Acrylonitrile polymerizes violently with many compounds.

Emergency Procedures

Always review the SDS of the purchased product for manufacturer-specific recommendations prior to use. Look at SDS for other modes of exposure.

Contacts **Emergency: 911** UW Special Constables: 519-888-4911 or ext. 22222 Poison Control: 1-800-268-9017 Whenever 911 is called, if possible, UW Special Constables should also be informed to make them aware of the emergency on campus and allow them to support as needed. Ask them to meet the paramedics and direct them to the incident location.	
Inhalation	▪ Move the victim into fresh air ▪ Call for a physician immediately ▪ Should breathing stop, provide artificial respiration and oxygen, if necessary
Skin Contact	▪ Immediately remove contaminated articles ▪ Rinse skin with water and shower, if necessary ▪ Consult a physician
Eye Contact	▪ Rinse adequately with water ▪ Call in an ophthalmologist immediately ▪ Remove contact lenses, if applicable
Ingestion	▪ Give victim a maximum of two glasses of water to drink ▪ Call for a physician immediately ▪ If medical care is not a viable option or available within an hour, induce vomiting if conscious

Storage

Acrylonitrile is in Storage Group L – Non-Reactive Flammables and Other Combustibles.

Store acrylonitrile in a dry and well-ventilated location in a tightly shut container. It should be away from heat, light, and sources of ignition, preferably in a flammables cabinet (if possible, in the presence of nitrogen). Due to acrylonitrile's ability to form peroxides, it should be peroxide tested every 6-months and before use. If the bottle is stored unopened, it should be disposed of after 12-months or upon the formation of cloudiness, immiscibility, or crystalline structures.

Hazardous Waste

Must be disposed of as per the University's Hazardous Waste Standard. Acrylonitrile waste should only be mixed with other organic solvent waste in a fumehood. This waste should then safely be disposed through the ESF. If peroxides have been formed in an acrylonitrile bottle, label the container as "waste containing peroxides" before taking it over to the ESF during waste disposal. If possible, include a concentration of the peroxide content.