



Acrylamide

Principal Investigator (PI) Approval is Required Prior to Performing this Procedure

Description

This standard operating procedure outlines the handling and use of acrylamide. Review this document and supply the information required in order to make it specific to your laboratory. In accordance with this document, laboratories should use appropriate controls, personal protective equipment, and disposal techniques when handling acrylamide.

Acrylamide is a reactive monomer used as a reagent in polymers or co-polymers. Polyacrylamide polymers are used in adhesives; sizing agents; soil conditioning agents; flocculants; waste treatments; chemical grouting and production of N - methylolacrylamide. Acrylamide must be used in a well-ventilated area.

Potential Hazards

- Acrylamide is considered a Particularly Hazardous Substance (PHS) because it is a probable human carcinogen.
- Possible routes of exposure include inhalation, skin contact, eye contact, and ingestion. Acrylamide is highly toxic by inhalation and skin contact. It can easily penetrate intact skin.
- Acrylamide is known to affect the nervous system with early signs of exposure including numbness, tingling, and tenderness to touch. Symptoms can be delayed several days to weeks and if exposure continues (even in small quantities) other symptoms may arise including excessive sweating, blue-reddish skin, peeling of skin, and weakness in limbs.
- Animal studies have shown some maternal and paternal reproductive health effects from exposure to acrylamide.
- Acrylamide may cause sensitization by inhalation or contact with skin.
- Acrylamide may polymerize explosively if heated to 183°F (84°C).
- Consult the SDS and [Laboratory Chemical Safety Summary: Acrylamide](#).

Occupational Exposure Limits (OELs):

- MIOSHA: **0.03 mg/m³, 8-hour PEL**
- ACGIH: **0.03 mg/m³, 8-hour TLV**
- NIOSH: **0.03 mg/m³, 10-hour REL**

Engineering Controls

If aerosols may be produced (e.g., weighing powder), acrylamide and any suspensions of acrylamide must be handled in a chemical fume hood, exhausted biological safety cabinet with negative pressure ductwork, or other exhausted enclosure. Aerosols may be produced during any open handling of dry powder and during open or pressurized manipulations of suspensions. It is recommended that labs post a sign explaining the aerosols procedures.

Work Practice Controls

- Set up a designated area for storage and work with acrylamide.
- When possible, order pre-cast polyacrylamide gels to avoid work with acrylamide powder. Acrylamide can also be ordered already in solution.
- Avoid contact with incompatibles including metals, oxidizing agents, reducing agents, acids, bases, and peroxides.
- Use bench pads to cover areas that may become contaminated with acrylamide powder or suspensions for easy clean-up.
- Wipe down the surfaces where acrylamide is used periodically with a detergent and water solution. To decontaminate surfaces, use a 1.6% potassium persulfate solution followed by 1.6% sodium metabisulfite. Let stand for 30 minutes, and then wash/wipe with plenty of water.
- If weighing dry acrylamide powder and the balance cannot be located in a fume hood or BSC, tare a container then add the material to the container in a hood and seal the container before returning to the balance to weigh the powder.
- Change gloves regularly (at least every two hours) and wash hands at the time of the glove change.
- Keep containers closed as much as possible.

Protective Equipment

- Standard nitrile laboratory gloves and a fully buttoned lab coat with sleeves extending to the wrists must be worn when handling acrylamide. When handling suspensions or solutions, choose a glove that is protective against the solvent. If gloves are splashed or come in contact with acrylamide, change them as soon as possible.
- If splashes may occur, wear goggles. Otherwise, wear standard laboratory safety glasses.
- In cases where the arms or torso may be exposed to liquid suspensions or dry particles, wear Tyvek sleeves and/or gowns (or other air-tight non-woven textile).

Transportation and Storage

- Acrylamide must be in sealed shatter-resistant containers during transportation. If the container is not shatter-resistant, use a secondary container.
- Store away from heat and flame.
- Store acrylamide away from any incompatible materials including metals, oxidizing agents, reducing agents, acids, bases, and peroxides.

Waste Disposal

Because most spent, unused and expired chemicals/materials are considered hazardous wastes, they must be properly disposed of. ***Do not dispose of chemical wastes by dumping them down a sink, flushing in a toilet or discarding in regular trash containers, unless authorized by UM Flint EHS.*** Contact Environment, Health and Safety (EHS) at (810) 766-6763 for waste containers, labels, manifests, waste collection and for any questions regarding proper waste disposal. Also refer to UM-Flint Hazardous Waste Management Program and EHS webpage <http://www.umflint.edu/ehs/environment-health-and-safety> for more information.

Exposures/Unintended contact



If the employee is in need of emergency medical attention, call 911 immediately.



For an actual chemical exposure/injury:

- Remove contaminated clothing. Flush exposed eyes or skin with water for at least 15 minutes. Seek medical attention (see below).
- For situations with risk of inhalation exposure (including spills of powder outside of a chemical fume hood), remove all persons from the contaminated area.
- If an ambulance is needed, call the UM-Flint Department of Public Safety (DPS) at 911 from any university telephone or (810) 762-3333 from cell phone or non-university telephone to request assistance.

Contact EHS for advice on symptoms of chemical exposure, or assistance in performing an exposure assessment.

Report all work related accidents, injuries, illnesses or exposures to UM-Flint DPS. Additionally, employees and supervisors must be sure to report the injury to EHS and complete and submit the [Illness and Injury Report Form](#) to WorkConnections within 24 hours. Follow the directions on the WorkConnections website [Forms Instructions](#) to obtain proper medical treatment and follow-up.

If you were involved in or observed an incident or near miss, please complete the [EHS Laboratory Incident and Near-Miss Report Form](#). This will be valuable in improving laboratory safety on UM-Flint campus.

MAJOR INJURIES	MINOR INJURIES –During Business Hours	MINOR INJURIES –After Business Hours
<p>Genesys Hospital One Genesys Parkway Grand Blanc, MI 48439 (810) 606-5710</p> <p>Hurley Medical Center One Hurley Plaza Flint, MI 48503 (810) 262-9000</p> <p>McLaren Hospital Flint 401 South Ballenger Hwy Flint, MI 48532 (810) 342-2000</p>	<p>Genesys Occupational Health Network 1460 Center Rd. Burton, MI 48509 (810) 715-4620 Mon. to Fri. 7:30 am to 10 pm Sat. & Sun. Noon to 8 pm</p> <p>McLaren Flint-Burton OCC Center 1459 S. Center Rd. Burton, MI 48509 (810) 496-0900 Mon. - Fri. 8 am to 8 pm Sat & Sun 10 am to 2 pm</p>	<p>Downtown Flint 420 S. Saginaw St. Flint, MI 48502 (810) 762-1550</p> <p>Genesys East 1096 S. Belsay Rd, Suite F Burton, MI 48509 (810) 743-3351</p> <p>Genesys North 4154 W. Vienna Rd Clio, MI 48420 (810) 686-7397</p> <p>Genesys South 8447 N. Holly Rd Grand Blanc, MI 48439 (810) 603-0856 Mon. - Fri. 6 to 10pm / Sat. & Sun. 1-10pm</p>

Click [here](#) for more information on the UM – Flint Emergency Preparedness and Response Plan.

Spill Procedure

- When a spill occurs, ***personal safety should always come first.***
- Alert and clear everyone in the immediate area where the spill occurred.
- Spills of dry acrylamide powder outside of a chemical fume hood or other enclosure should be referred to EHS at (810) 766-6763.

- Spills of liquid suspensions should be absorbed with sand or other non-combustible absorbent material and placed in containers for disposal. Decontaminate the area with 1.6% potassium persulfate, followed by 1.6% sodium metabisulfite. Rope off the area and let stand for 30 minutes, and then wash/wipe area with plenty of water.
- For spills of dry powders in a chemical fume hood or other enclosure, wipe up the powder using a cloth dampened with water, or wet the powder with water and then wipe with a dry cloth. Minimize the fume hood or enclosure opening during this process. Decontaminate the area with the solutions mentioned in the previous bullet. Contaminated PPE and clean-up materials must be placed in a sealed container for pick-up by EHS (see Waste Disposal section for more information).

Additional Spill Links:

- www.oseh.umich.edu/pdf/chemspil.pdf
- <http://www.oseh.umich.edu/emer-chemical.shtml>.

Report all emergencies, suspicious activity, injuries, spills, and fires to the UM-Flint Department of Public Safety (DPS) at 911 from any university telephone or (810) 762-3333 from cell phone or non-university telephone. Register with the [University of Michigan-Flint Emergency Alert System](#) via Wolverine Access. Also, preprogram the UM-Flint DPS telephone number (810) 762-3333 into your cell phone for quick, easy use.

Training of Personnel

All personnel are required to complete Laboratory Safety Training. Documentation of the training is required. This training can be accomplished by completing the **Comprehensive Laboratory Safety** session (**BLS009** or equivalent) via [MyLINC](#), or UM-Flint EHS on-line training or other equivalent approved by EHS. Furthermore, all personnel shall read and fully adhere to this SOP when handling acrylamide.

Certification

I have read and understand the above SOP. I agree to contact my Supervisor or Lab Manager if I plan to modify this procedure.

Name	Signature	UM ID #	Date

Principal Investigator _____

Revision Date _____