Standard Operating Procedure for Acrylamide

# Section 1 – Lab-Specific Information

**Building/Room(s) covered by this SOP: Bag 005, 023**

**Unit or department: Chemistry**

**Principal Investigator Name: Sarah Keller**

**Principal Investigator Signature/Date:  24 Feb 2025**

**This SOP was created by (if not PI): Not applicable**

**Name/Title/Date/Signature**

# Section 2 – Hazards

This SOP presents guidelines and procedures for the safe use of Acrylamide (CAS # 79-06-1) in a laboratory or clinic environment and any operation capable of generating Acrylamide dust or aerosols. In addition to use of this SOP, persons working with Acrylamide should be thoroughly familiar with general guidelines for high hazard chemicals identified in the High Hazard Chemical Policy (EHS 200.09) and all other applicable LSUHSC chemical safety policies. All current applicable MSDSs should be available and reviewed prior to use.

Un-polymerized acrylamide is toxic (neurotoxin) and a suspected carcinogen. Polymerized acrylamide is non-toxic.

Our laboratory converts stock acrylamide into a polymerized (non-toxic) form.

**Physical Hazards**

• Combustible Solid (may also be dissolved in flammable liquids).

• Incompatibilities and reactivity: sensitive to air, acids, oxidizing agents, iron and iron salts, copper, brass and free radical initiators.

• Acrylamide may polymerize violently on strong heating or exposure to strong base. May react violently with strong oxidizers.

**Health Hazards**

• Acrylamide monomer is highly toxic by inhalation and via skin contact (can penetrate unbroken skin easily). The polymer is not generally considered toxic.

• Exposure to aqueous acrylamide solutions can cause eye and skin irritation upon contact

• Repeated exposure to the skin may cause contact dermatitis which is characterized by redness, swelling and blistering.

• Inhalation exposure to dust may cause upper respiratory tract irritation

• Chronic exposure may result in neurotoxic effects including unsteadiness, muscle weakness, and numbness in the feet (leading to paralysis of the legs), numbness in the hands, slurred speech, vertigo and fatigue.

• Acrylamide is a potential occupational carcinogen

**The SDS for acrylamide is found at https://mychem.ehs.washington.edu/Chemical/ViewSDS/413**



# Section 3 – Engineering Controls and Personal Protective Equipment (PPE)

## Engineering controls

• At all possible times, perform work with unpolymerized acrylamide in a laboratory fume hood or weighing hood. Work at least 6” inside of hood and set sash at lowest possible position. Any chemical fume hood used must be tested and passed by EH&S.

• Because acrylamide powder presents the highest level of hazard, laboratory personnel are strongly encouraged to purchase aqueous stock solutions or pre-made gels

• If unpolymerized acrylamide is weighed, no residue should be left on the scale.

## Hygiene measures

Avoid contact of unpolymerized acrylamide with skin, eyes, and clothing by using PPE of eye protection, gloves, and a lab coat. Wash hands after removing PPE, before breaks, and immediately after handling the chemical. If acrylamide comes into contact with any PPE, the PPE shall be immediately removed and discarded properly. Any potentially exposed body parts should be washed immediately.

## Skin and body protection

Chemically compatible laboratory coats that fully extend to the wrist must be worn and be appropriately sized for the individual and buttoned to their full length. Lab coats available in the Chem Stockroom are the proper type. Personnel must also wear full-length pants, or equivalent, and close-toe shoes. The area of skin between the shoe and ankle must not be exposed.

## Hand protection

Hand protection is required for the activities described in this SOP.Double layers of nitrile gloves is the standard practice for handling the solid powder. Nitrile gloves are available in the Chem Stockroom

Gloves must be inspected prior to use, including a check for pinholes.

Use proper glove removal technique (without touching glove’s outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands immediately after glove removal.

## Eye protection

ANSI Z87.1-compliant eye protection is required for all work with acrylamide powder. Ordinary prescription glasses will NOT provide adequate protection unless they also meet the Z87.1 standard and have compliant side shields. Safety glasses are the minimum eye protection; goggles and face shields may also be used.

## Respiratory protection

Minimum respiratory protection is to use a mask when handling unpolymerized acrylamide.

**If individuals are concerned about respiratory protection, contact the EH&S** [Respiratory Protection Program](https://www.ehs.washington.edu/workplace/respiratory-protection) **administrator at uwresp@uw.edu, or call 206.543.7388** **to discuss respiratory protection or to enroll in the program so a respiratory protection analysis can be performed**. Program enrollment includes medical evaluation, training and fit testing for an appropriate respirator. Where air-purifying respirators are appropriate, use a full-face respirator with appropriate respirator cartridges as a backup to engineering controls. Use a full-face supplied air respirator if it is the sole means of protection.

# Section 4 – Special handling and storage requirements

* Acrylamide powder easily becomes airborne and may result in personal exposure and area contamination. Use care to avoid dispersing dust. Mixing or dispensing should be done within a fume hood.
* Acrylamide powder should be transported in closed containers, in the smallest amounts necessary, and use aids such as carts, chemical transport carriers, etc
* Store acrylamide in containers that are tightly closed.
* Keep acrylamide (including residue in empty containers) away from heat, flames, and sources of ignition
* Areas where acrylamide gels are poured should be protected with a lab bench cover (“diaper paper”), and bench covers should be disposed of appropriately with EH&S upon contamination.
* Clean all contaminated surfaces with soap and water, and then dry.
* Place all contaminated disposable items in appropriate laboratory waste for disposal.
* Non‐disposable/re‐usable utensils, glassware, and other surfaces contaminated with acrylamide must be decontaminated at the end of the laboratory work session. Complete this inside the hood before removing any of the items.
* When work is completed, remove gloves and wash hands with soap and water.

Users of chemicals are required to follow [labeling requirements](https://www.ehs.washington.edu/chemical/chemical-container-labels) when transferring chemicals to secondary containers and when labeling containers with chemical waste, UW-synthesized chemicals, [peroxide-forming chemicals](https://www.ehs.washington.edu/resource/ehs-guidelines-peroxide-forming-chemicals-168), and [Chemicals of Interest](https://www.cisa.gov/appendix-chemicals-interest). Requirements for labeling containers and templates for creating labels are available on the [EH&S website](http://www.ehs.washington.edu/chemical/chemical-container-labels).

Check [Section 2 of the Lab Safety Manual](https://www.ehs.washington.edu/resource/laboratory-safety-manual-510) and the [Chemical Compatibility Chart](https://www.ehs.washington.edu/system/files/resources/Incompatible_Chemicals_Focus_Sheet.pdf) on the EH&S website for incompatible chemical groups.

Check [Section 2 of the Lab Safety Manual](https://www.ehs.washington.edu/resource/laboratory-safety-manual-510) for information on chemical transport practices.

# Section 5 – Spill and accident procedures

Chemical spills must be cleaned up as soon as possible by personnel wearing proper PPE. All other persons should leave the area.

Do **not** attempt to clean up any spill if you are **not** comfortable doing so or if you feel unsure of your ability to complete the task safely. In this situation, evacuate the area and call 9-1-1 on campus phone for help. If the spill is out of control, call 9-1-1. If a person is injured, exposed or suspected of being exposed, call 9-1-1 and follow the EXPOSURE PROCEDURES (below).

Spill area must be cleaned up in the following manner:

• Notify all lab personnel of spills (with the details of the spill and actions being taken) and regulate access, as necessary, to the area.

• Spill volumes less than approximately 25ml/25g can be cleaned by lab personnel as follows:

• Small liquid spill (un-polymerized) - Absorb with absorbent material pads and place into containers for disposal. Treat site with 1.6% potassium persulfate, then with 1.6 % sodium metabisulfite. Let stand for 30 minutes, and then wash with plenty of water.

• Small dry spill (un-polymerized) - Scrape material into clean, dry containers and cover. Minimize airborne dust generation. May choose to lightly wet spill area. Treat site with 1.6% potassium persulfate, then with 1.6 % sodium metabisulfite. Let stand for 30 minutes, and then wash with plenty of water.

• For spill volumes greater than approximately 25ml/25g, contact the PI for assistance. If the PI is unavailable, contact EH&S.

• Personnel cleaning the spill shall, at minimum, wear the same PPE required for the handling and use of acrylamide.

• In the event of skin contact, immediately remove contaminated clothing and wash affected areas with soap and copious amounts of water.

• In case of contact with eyes, immediately flush eyes with copious amounts of water for at least 15 minutes and subsequently obtain medical attention.

• If inhalation produces excessive health symptoms, immediately relocate to fresh air and subsequently obtain medical attention.

• In the event of ingestion, obtain immediate medical attention. Do not induce vomiting unless directed to do so by medical personnel.

• Report all spills, regardless of size, to laboratory PI,

Spill cleanup materials must be disposed of by double bagging them in plastic bags labeled with the contents. Submit a request for EH&S to pick up the materials.

For questions on spill cleanup, contact EH&S spill consultants at 206‐543‐0467 during normal business hours (Monday-Friday, 8 a.m. to 5 p.m.).

Any spill, exposure or near miss incident requires the involved person or supervisor to complete and submit the [Online Accident Reporting System (OARS)](https://www.ehs.washington.edu/workplace/accident-and-injury-reporting) form on the EH&S website within 24 hours ([certain types of incidents](https://ehs.washington.edu/workplace/accident-and-injury-reporting) require immediate notification) at oars.ehs.washington.edu.

**Exposures:** If a person is injured, exposed, or suspected of being exposed to acrylamide, follow procedures listed here:

**Perform first aid immediately.**

* **Inhalation exposure**: Move out of contaminated area; get medical help.
* **Sharps injury** (needle stick or subcutaneous exposure): Scrub exposed area thoroughly for 15 minutes using warm water and sudsing soap.
* **Skin exposure:** Use the nearest safety shower for 15 minutes; stay under the shower and remove clothing; use a clean lab coat or spare clothing for cover‐up.
* **Eye exposure:** Use the eye wash for 15 minutes while holding eyelids open.

**Get Help.**

* **Call** 9-1-1 or go to nearest Emergency Department (ED); provide details of exposure:
  + - Agent
    - Dose
    - Route of exposure
    - Time since exposure
* **Bring** **the SDS and this SOP** to the Emergency Department
* **Notify your supervisor** as soon as possible for assistance
* **Secure the area** before leaving; lock doors and indicate spill if needed

**Report the incident to Environmental Health & Safety**.

* **Notify** **EH&S immediately** after providing first aid and/or getting help.
  + During business hours (M‐F/8‐5), call 206‐543‐7262.
  + Outside of business hours, call 206‐685‐UWPD (8973) to be routed to EH&S Staff On Call.
* The involved person or supervisor submits the UW Online Accident Reporting System (OARS) form on the EH&S website within 24 hours ([certain types of incidents](https://ehs.washington.edu/workplace/accident-and-injury-reporting) require immediate notification) at oars.ehs.washington.edu.

# Section 6 – Waste accumulation and disposal procedures

Polymerized acrylamide is non-toxic and can be disposed of in the trash.

Unpolymerized liquid is hazardous waste. It should be collected in a separate container for collection by EH&S.

Refer to the SDS and [UW Laboratory Safety Manual](https://www.ehs.washington.edu/resource/laboratory-safety-manual-510), Section 3 for guidance on waste handling, labeling, accumulation, storage and pickup.

Per [UW Administrative Policy Statement 11.2](https://www.washington.edu/admin/rules/policies/APS/11.02.html), the University of Washington Environmental Health & Safety Department has full responsibility for collection of hazardous waste for the University, all its campuses, and off-site locations; **University laboratories cannot contract with an outside vendor to collect hazardous waste.**

**Be aware that many laboratory accidents happen from inadvertent disposal of** [**incompatible wastes**](https://www.ehs.washington.edu/system/files/resources/Incompatible_Chemicals_Focus_Sheet.pdf) **into the same waste container.** Therefore, identify different waste streams as appropriate.

**Accumulate waste at the point of generation** in a sturdy jar with a securely-closable/screw‐top lid. Spill cleanup materials must be disposed of by double bagging them in plastic bags labeled with the contents.

Email [labcheck@uw.edu](mailto:labcheck@uw.edu) with questions.

Manage chemical and hazardous chemical waste separately from other waste streams such as biohazardous waste. Never autoclave chemical waste because it can produce hazardous chemical vapors, aerosols, and explosive reactions.

In certain cases, chemical waste can be treated and disposed of into the sanitary sewer or exchanged with other University units. [Chemical treatment and recycling](https://www.ehs.washington.edu/chemical/chemical-treatment-and-recycling) and [chemical exchange](https://www.ehs.washington.edu/chemical/chemical-exchange) options and are available on the EH&S website.

**All chemical waste containers must be labeled** with a [UW Hazardous Waste Label](https://www.ehs.washington.edu/chemical/hazardous-chemical-waste-disposal). Refer to [How to Label Chemical Waste Containers](https://www.ehs.washington.edu/system/files/resources/how-to-label-chemical-waste-containers.pdf).

To request a collection of chemical waste, submit a form on the [Chemical Waste Disposal](https://www.ehs.washington.edu/chemical/hazardous-chemical-waste-disposal) webpage on the EH&S website or directly in [MyChem](https://www.ehs.washington.edu/chemical/mychem) inventory. Contact EH&S at 206.616.5835 or [chmwaste@uw.edu](mailto:chmwaste@uw.edu) with questions.

Work area decontamination procedures as described in the section on spills should be followed, using PPE described above.

Visit the [Hazardous Material Disposal and Recycling](https://www.ehs.washington.edu/popular-services/hazardous-material-disposal-and-recycling) webpage on the EH&S website for information on disposing, recycling and surplusing materials.

# Section 7 – Protocol

Protocols for handling acrylamide in the Keller Lab are the same as outlined in Sections 3 and 4 above.

Refer to Section 2 of the [UW Laboratory Safety Manual](https://www.ehs.washington.edu/resource/laboratory-safety-manual-510) on the EH&S website for additional guidance on chemical management and preparation for use for [particularly hazardous substances](https://www.ehs.washington.edu/resource/particularly-hazardous-substances-655) (PHSs).

**NOTE:** Any deviation from this SOP requires approval from Principal Investigator.

# Section 8 – Special Precautions for animal use (Not relevant)

This section is not applicable (“N/A”) because our lab does not use animals.

[**PARTICULARLY HAZARDOUS SUBSTANCE**](https://www.ehs.washington.edu/resource/particularly-hazardous-substances-655) **INVOLVED?**

**YES: Sections #9 to #11 are Mandatory.**

# Section 9 – Approvals required

All staff working with acrylamide must consult this SOP prior to starting work. They must also review the acrylamide SDS, which is available through the Keller Laboratory website and EH&S.

# Section 10 – Decontamination

• If the eyes or body of any person may have been exposed, a safety shower/eye wash must be available for immediate use. Personnel who are working with acrylamide must be aware of location of nearest Safety Shower/Eye Wash and verify that a current certification of performance tag is present.

• Personnel shall rinse exposed areas of skin and/or eyes with copious amounts of water for at least 15 minutes.

• All equipment, materials and work surfaces that have/ potentially have become contaminated shall be cleaned in accordance with those identified for small spill in Section 5.

# Section 11 – Designated area

* Acrylamide powder easily becomes airborne and may result in personal exposure and area contamination. Use care to avoid dispersing dust. Mixing or dispensing should be done within a fume hood.

# Section 12 – Documentation relevant to ALL Particularly Hazardous Substances

* Lab members are expected to review the laboratory’s inventory of chemicals to identify any “Particularly Hazardous” substances. The inventory appears in MyChem with the letters “P” or “B” in the column labeled “Reg”.
* Before working with any of the “Particularly Hazardous” substances, lab members must review the laboratory’s SOP for that substance to learn how to protect themselves from the hazards and how to enact emergency procedures.
* Ready access to SOPs and to a Safety Data Sheets for all Particularly Hazardous materials used in the Keller Lab are available through the Keller Lab website.
* If lab any lab member determines that the SOP should be revised or if the substance is being used in a way that is not covered in the SOP, the lab member should bring it to the attention of the P .and propose changes to this SOP.
* Lab members must attest (in a separate document that applies to all Particularly Hazardous substances) that they will adhere to the policies in this SOP.