Standard Operating Procedure

**Acrylamide and bis-acrylamide**

Print a copy and insert into your   
*Laboratory Safety Manual* and *Chemical Hygiene Plan*.   
Refer to instructions for assistance.

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| **Department:** | Chemistry & Biochemistry |
| **Date SOP was written:** | 1/15/2013 |
| **Date SOP was approved by PI/lab supervisor:** | 1/15/2013 |
| **Principal Investigator:** | Irene Chen |
| **Internal Lab Safety Coordinator/Lab Manager:** | Irene Chen |
| **Lab Phone:** | 805-893-8085 |
| **Office Phone:** | 805-893-8364 |
| **Emergency Contact:** | Irene Chen, 617-710-8741 (cell) |
| *(Name and Phone Number)* |
| **Location(s) covered by this SOP:** | *Chemistry 1142* |
| *(Building/Room Number)* |

**Type of SOP:**  Process Hazardous Chemical  Hazardous Class

**Purpose**

Acrylamide and bis-acrylamide are both select carcinogens and neurotoxins. They are used in polymerized form to analyze the size of proteins, DNA, RNA, and protein-DNA complexes in gel electrophoresis. Acrylamide is purchased as a liquid solution (e.g., Sequagel) which is highly toxic due to the high potential of absorption through the skin yet this exposure is diminished when acrylamide is in its polymerized form.

**Physical & Chemical Properties/Definition of Chemical Group**

CAS#: 79-06-1 (Acrylamide); 110-26-9 (Bis-acrylamide)

Class: **Select carcinogen, neurotoxin**

Molecular Formula: C3H5NO (Acrylamide); C7H10N2O2 (Bis-acrylamide)

Form (physical state): Liquid

Color: N/A

Boiling point: N/A

**Potential Hazards/Toxicity**

Select Carcinogens are a category of chemicals where the available evidence strongly indicates that the substances cause human carcinogenicity.

Acrylamide is also toxic if in contact with skin or swallowed. It is irritating to eyes and skin. It may cause sensitization by inhalation and skin contact and is readily absorbed through skin. The target organs are nerves and kidneys.

**Personal Protective Equipment (PPE)**

**Respiratory Protection**

A ½ or full face respirator equipped with appropriate cartridges should be used any time there is the potential for exposure to vapor and/or dust and a fume hood cannot be used. Training is required for respirators. This situation will be uncommon as we generally purchase acrylamide in solution.

Respirators should be used only under any of the following circumstances:

* As a last line of defense (i.e., after engineering and administrative controls have been exhausted).
* When Permissible Exposure Limit (PEL) has exceeded or when there is a possibility that PEL will be exceeded.
* Regulations require the use of a respirator.
* An employer requires the use of a respirator.
* There is potential for harmful exposure due to an atmospheric contaminant (in the absence of PEL)
* As PPE in the event of a chemical spill clean-up process

Lab personnel intending to use/wear a respirator mask must be trained and fit-tested by EH&S. This is a regulatory requirement. (<http://map.ais.ucla.edu/go/1004655>)

**Hand Protection**

Nitrile gloves are recommended.

NOTE: Consult with your preferred glove manufacturer to ensure that the gloves you plan on using are compatible with Acrylamide and bis-Acrylamide

Refer to glove selection chart from the links below:

<http://www.ansellpro.com/download/Ansell_8thEditionChemicalResistanceGuide.pdf>

OR

<http://www.allsafetyproducts.biz/page/74172>

OR

<http://www.showabestglove.com/site/default.aspx>

OR

<http://www.mapaglove.com/>

**Eye Protection**

ANSI approved safety glasses or goggles are recommended.

**Skin and Body Protection**

Lab coat, long pants, and closed-toe shoes are required.

**Hygiene Measures**

After working with acrylamide, immediately remove gloves, wash hands and arms with soap and water.

**First Aid Procedures**

**If inhaled**

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician

**In case of skin contact**

Immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention immediately

**In case of eye contact**

Immediately flush eyes with copious amounts of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention immediately

**If swallowed**

Wash out mouth with water provided person is conscious. Never give anything by mouth to an unconscious person. Call a physician.

**Special Handling and Storage Requirements**

**Precautions for safe handling**

When working with acrylamide, the area must be labeled with a sign stating “CAUTION, CANCER HAZARD – SELECT CARCINOGEN”.

**Conditions for safe storage**

The storage space (i.e. refrigerator) must also be labeled with a sign stating “CAUTION, CANCER HAZARD – SELECT CARCINOGEN”, and acrylamide must be stored in a secondary container.

**Spill and Accident Procedure**

**Chemical Spill Dial 911 and 893-3194**

**Spill** – Assess the extent of danger. Help contaminated or injured persons. Evacuate the spill area. Avoid breathing vapors. If possible, confine the spill to a small area using a spill kit or absorbent material. Keep others from entering contaminated area (e.g., use caution tape, barriers, etc.).

**Small (<1 L)** – If you have training, you may assist in the clean-up effort. Use appropriate personal protective equipment and clean-up material for chemical spilled. Double bag spill waste in clear plastic bags, label and take to the next chemical waste pick-up.

**Large (>1 L)** – Dial **911** and EH&S at **893-3194** for assistance.

**Chemical Spill on Body or Clothes** – Remove clothing and rinse body thoroughly in emergency shower for at least 15 minutes. Seek medical attention. *Notify supervisor and EH&S at* **893-3194** *immediately.*

**Chemical Splash Into Eyes** – Immediately rinse eyeball and inner surface of eyelid with water from the emergency eyewash station for 15 minutes by forcibly holding the eye open. Seek medical attention. *Notify supervisor and EH&S at* **893-3194** *immediately.*

# **Medical Emergency Dial 9-911**

**Life Threatening Emergency:** Dial 9-**911** Contact PI and EH&S as soon as practical. *Note: All serious injuries must be reported to EH&S at x3194 within 8 hours.*

**Non-Life Threatening Emergency** – Go to Student Health, building 588, **x5361,** Hours: M, T, R, F 8 a.m. to 4:30 p.m, W 9 a.m. to 4:30 pm and R 5 to 7 p.m. by appointment. At all other times report to Goleta Valley Cottage Hospital (emergency room) at 351 South Patterson Avenue, **805-967-3411**. Contact PI and EH&S as soon as practical.*Note: All serious injuries must be reported to EH&S at x3194 within 8 hours.*

**Decontamination/Waste Disposal Procedure**

Wearing proper PPE, please decontaminate equipment and bench tops using water. Please dispose of the used material and disposables contaminated with this material as hazardous waste.

*General hazardous waste disposal guidelines:*

**Label Waste**

* Affix a hazardous waste tag on all waste containers as soon as the first drop of waste is added to the container

**Store Waste**

* Store hazardous waste in closed containers, in secondary containment and in a designated location
* Double-bag dry waste using transparent bags
* Waste must be under the control of the person generating & disposing of it

**Dispose of Waste**

* Dispose of regularly generated chemical waste within 90 days
* Call EH&S for questions and for pick-up
* Empty Containers: Dispose as hazardous waste irrespective of the container size

Prepare for transport to pick-up location

* Check waste tag
* Use secondary containment

**Safety Data Sheet (SDS) Location**

Online SDS can be accessed at <http://www.chem.ucsb.edu/about/safety> .

**Protocol/Procedure (Add lab specific Protocol/Procedure here)**

Acrylamide is purchased in aqueous solution to avoid exposure during weighing or mixing the powder. Always wear PPE and take precautions to minimize handling when handling the solution. Avoid handling powder. Clean up spills promptly to avoid acrylamide dust formation. Dispose of plasticware that has come into contact with acrylamide properly. Rinse out glassware promptly. Once polymerized, acrylamide is less toxic, but continue to use PPE and appropriate precautions as some unpolymerized acrylamide typically remains.

**NOTE**

Any deviation from this SOP requires approval from PI.

**Documentation of Training** (signature of all users is required)

* Prior to conducting any work with Acrylamide and bis-Acrylamide, designated personnel must provide training to his/her laboratory personnel specific to the hazards involved in working with this substance, work area decontamination, and emergency procedures.
* The Principal Investigator must provide his/her laboratory personnel with a copy of this SOP and a copy of the SDS provided by the manufacturer.
* The Principal Investigator must ensure that his/her laboratory personnel have attended appropriate laboratory safety training or refresher training within the last one year.

I have read and understand the content of this SOP:

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| **Name** | **Signature** | **Date** |
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