

OHS Registration #: _____

Expiration Date: _____

**STANDARD OPERATING PROCEDURE/APPROVAL FORM
FOR CARCINOGENS AND HIGHLY TOXIC MATERIALS**

Instructions: Please complete this form to request approval to use and possess highly toxic or carcinogenic material from the University Chemical Hygiene Committee as required by Chapter 12 of the University Chemical Hygiene Plan and University Policy 7-37.

Submit a separate form for each chemical. Copies of the current guidelines and Chemical Hygiene Plan are available at the DOHS web site: <http://www.udel.edu/OHS/>. For questions, please contact the University Chemical Hygiene Officer at 831-2103.

Form Updated: January 2007

Please attach a detailed synopsis of how this material will be used in your research.

Section I – Information

1. Principal Investigator(s): _____
2. E-Mail Address: _____
3. Department: _____
4. Address: _____
5. Phone Number: _____
6. Fax Number: _____
7. Lab(s) to be Used: _____
8. Chemical: Acrylamide

Section II – Use and Storage

A. Purchasing

All purchases of this material must have approval from the Principal Investigator (PI) or authorized personnel before ordering. The user is responsible to ensure that a current Material Safety Data Sheet (MSDS) is obtained unless a current one is already available within the laboratory. Quantities of this material will be limited to _____, and/or the smallest amount necessary to complete the experiment.

B. Authorized personnel

Please select the general categories of personnel who could obtain approval to use this material:

1. Principal Investigator
2. Graduate Students
3. Undergraduates
4. Technical Staff
5. Post Doctoral Employees
6. Other (Describe): _____

Please list the specific personnel and their approval level (Attach an addendum to this form for additional personnel):

NOTE: The Principal Investigator must be aware of all purchases of this material. The Principal Investigator must assure the there is not an exceedance of the quantity limits.

1. _____	<input type="checkbox"/> Purchase	<input type="checkbox"/> Use the Material
2. _____	<input type="checkbox"/> Purchase	<input type="checkbox"/> Use the Material
3. _____	<input type="checkbox"/> Purchase	<input type="checkbox"/> Use the Material
4. _____	<input type="checkbox"/> Purchase	<input type="checkbox"/> Use the Material
5. _____	<input type="checkbox"/> Purchase	<input type="checkbox"/> Use the Material

The Principal Investigator will update this section when any personnel changes occur. If changes occur, document the changes (include the record of training of additional personnel) in the laboratory's files and submit an addendum to the University Chemical Hygiene Officer with all training documentation.

C. Storage

Materials will be stored according to compatibility and label recommendations in a designated area.

1. Please list compounds that this chemical is incompatible with:
 - Oxidizing Agents
 - Bases
 - Strong Reducing Agents
 - Other: _____
2. Please list special storage requirements (I.E.: Refrigerated, Inert Atmosphere, Desiccated, etc.):
 - Store between 15 and 30 deg C
 - Store away from incompatible materials
 - Other: _____
3. Please list specific storage area (This Area Must be Marked and Labeled): _____

Storage areas will be inspected by laboratory personnel on a regular basis. Personnel will check for safety concerns such as improper storage, leaking/damaged container(s), damaged labels, quantities in excess of approved limits, theft/disappearance of material, etc. The inspector will also determine if an inventory reduction is possible. The Principal Investigator will designate one individual to complete this inspection.

4. Please select an inspection frequency:

Weekly Biweekly
 Bimonthly Monthly

D. Use location:

Materials shall be used only in the following designated areas.

Check all that apply:

1. Demarcated Area in Lab (Describe): _____
2. Fume Hood
3. Glove Box
4. Other (Describe): _____

Section III – Personnel Safety and Protection

A. Training requirements:

All users must demonstrate competency and familiarity regarding the safe handling and use of this material prior to purchase. The Principal Investigator is responsible for maintaining the training records for each user of this material. Training should include the following:

1. Review of current MSDS
2. Chemical Hygiene/Right-To-Know
3. Chemical Waste Management
4. Review of the OSHA Lab Standard
5. Review of the Chemical Hygiene Plan
6. Special training provided by the department/supervisor
7. Review of the departmental safety manual if applicable
8. Safety meetings and seminars
9. One-on-One hands-on training with the Principal Investigator or other knowledgeable laboratory personnel.
10. Other: _____

B. Personal Protective Equipment:

All personnel are required to wear the following personal protective equipment whenever handling this material:

1. Proper Laboratory Attire (Pants or dresses/shorts below the knees, sleeved shirt, close-toe shoes)
2. Safety Glasses – **Researchers must upgrade to chemical safety splash goggles if a splash, spray or mist hazard exists. In general, safety glasses can be worn if the fume hood sash is properly positioned to provide the splash, spray and mist protection, otherwise indirect venting chemical safety splash goggles must be worn.**
3. Lab Coat
4. Chemical Protective Gloves: Butyl Rubber and Nitrile Rubber

Personnel may be required to wear other Personal Protective Equipment when working with this material. The Principal Investigator should contact the University Chemical Hygiene Officer to discuss the selection of chemical protective clothing (aprons, suits and gloves) and respirators. Please check all that apply:

1. <input type="checkbox"/> Chemical Safety Splash Goggles	2. <input type="checkbox"/> Face Shield
3. <input type="checkbox"/> Chemical Protective Clothing (Describe): _____	
4. <input type="checkbox"/> Chemical Protective Splash Apron (Describe): _____	
5. <input type="checkbox"/> Respirator (Type): _____	
6. <input type="checkbox"/> Other (Describe): _____	

C. Safe Work Practices

The following safe work practices should be employed when using this material:

1. Wear all required personal protective equipment
2. Cover open wounds
3. Wash hands thoroughly when work with the material is completed
4. No mouth pipetting
5. Use of sharps, such as glass Pasteur pipettes, needles, razor blades, etc. should be avoided or minimized
6. Must not work alone in the laboratory
7. Acrylamide is a suspect human carcinogen and neurotoxin. Users must follow all safe work practices listed in the Chemical Hygiene Plan.
8. Avoid generating and breathing dust
9. Please list any other safe work practices: _____

D. Personnel Decontamination and Emergency Response

For most exposures, decontamination should occur as follows:

1. Small Skin Exposures –
 - a. Wash contaminated skin in sink with tepid water for 15 minutes
 - b. Have buddy locate the MSDS
 - c. Wash with soap and water
 - d. Contact Occupational Health and Safety at 831-8475 for further direction
2. Eye Exposure –
 - a. Locate the emergency eye wash
 - b. Turn eye wash on and open eyelids with fingers
 - c. Rinse eyes for 15 minutes

- d. Have buddy contact 911 for the Newark Campus, 9-911 for all others and locate the MSDS
 - e. Notify OHS
3. Large Body Area Exposure –
- a. Locate the emergency safety shower
 - b. Stand under shower and turn it on
 - c. Rinse whole body while removing all contaminated clothing
 - d. Have buddy contact 911 for the Newark Campus, 9-911 for all others and locate the MSDS
 - e. Rinse body for 15 minutes
 - f. Notify OHS
4. Ingestion Emergencies –
- a. If swallowed do NOT induce vomiting.
 - b. If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.
 - c. Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious
 - d. Have buddy contact 911 for the Newark Campus, 9-911 for all others and locate the MSDS
 - e. Notify OHS
5. Inhalation Emergencies –
- a. If fumes or combustion products are inhaled remove from contaminated area.
 - b. Lay patient down. Keep warm and rested.
 - c. Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.
 - d. Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.
 - e. Have buddy contact 911 for the Newark Campus, 9-911 for all others and locate the MSDS
 - f. Notify OHS
6. Injection Emergencies –
- a. Clean the areas with soap and water
 - b. Allow the wound to bleed
 - c. Have buddy contact 911 for the Newark Campus, 9-911 for all others and locate the MSDS
 - d. Notify OHS

Please list any special decontamination procedures: _____

E. Exposure Symptoms and Treatment

Please list the emergency procedures to be followed in the event of an exposure. These will be found in the MSDS for the compounds:

1. **Skin Exposure Symptoms:** Skin contact with the material may produce toxic effects; systemic effects may result following absorption. The material may cause mild but significant inflammation of the skin either following direct contact or after a delay of some time. Repeated exposure can cause contact dermatitis which is characterized by redness, swelling and blistering. Entry into the blood-stream, through, for example, cuts, abrasions or

lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

2. **Eye Exposure Symptoms:** This material may produce eye irritation in some persons and produce eye damage 24 hours or more after instillation. Moderate inflammation may be expected with redness; conjunctivitis may occur with prolonged exposure.
3. **Ingestion Symptoms:** The material is moderately discomforting to the gastro-intestinal tract and may be harmful if swallowed. In animal studies, large single doses or repeated small doses of acrylamide and some of its congeners produce progressive stiffness and/ or weakness of the hind-quarters, urinary retention, ataxia and eventually an inability to stand. The syndrome may develop over days or weeks. Humans exposed to acrylamide monomer develop peripheral neuropathies with mid-brain disturbance and numbness, paraesthesia and weakness, particularly in the lower limbs. Bluish cold hands which dripped sweat, and erythema and peeling of the palms have also been described. Other signs may include dysarthria, tremor, disturbances in gait, visual changes such as reduction of red and green discoloration and a hypertensive retinopathy.
4. **Inhalation Symptoms:** Dusts can probably cause irritation of the nose and throat. High concentrations of dust may cause coughing and sneezing. It appears unlikely that a serious occupational poisoning could result from short-term inhalation alone since skin absorption is a major route of occupational exposure. However, inhalation exposure can contribute to the total exposure. If large quantities of acrylamide dust are inhaled, move the person to fresh air and seek medical attention at once.

The ChemWatch MSDS, which is available at <http://www.udel.edu/OHS/> oftentimes, has treatment information for Emergency Room Personnel and Doctors to follow. Please list any information that can be provided to assist with the treatment:

Treat symptomatically. Principal routes of exposure are usually by skin contact/absorption and inhalation of generated dust. Repeated or prolonged exposure to acrylamides may result in polyneuropathy that is insidious and distal in onset. The presence of ataxia and, occasionally, dysarthria and tremor suggests central midbrain involvement. Signs and symptoms include weakness, paraesthesias, fatigue, lethargy and decreased pin sensation, vibratory loss, decreased reflexes and positive Romberg sign. Severity is worst in distal portions of the extremities. Desquamation of the palms and soles, sweating and peripheral vasoconstriction are prominent. Recovery typically occurs within several months to a year of cessation of exposure although severe exposures may result in permanent dysfunction. The relationship between neurotoxicity and reproductive toxicity for acrylamide and several of its congeners was studied to evaluate the effects in a second generation born of exposed parents dosed from weaning to mating. Dominant lethal effects and neurotoxicity were induced in male rats, with minimal or no effects in females. Depending on the compound, greater effects may or may not be observed in the second generation Chapin, R.E. et al; *Fundamental and Applied Toxicology*, 27, 9-24, 1995.

F. Spills

The laboratory should be prepared to clean up minor spills (25 ml/25 g or less) of highly toxic/carcinogenic materials should they occur in a properly operating fume hood. Chemical spill clean up guidance can be found at <http://www.udel.edu/OHS/chemspillkit/chemspillkit.html>. Laboratory personnel cleaning up a spill will wear all personal protective equipment listed above and manage all cleanup debris according to the waste disposal section. Notify OHS of any spills, even if the lab staff handled the clean-up.

Please list the following:

1. Location of Spill Cleanup Materials for a small spill: _____

2. Any special measures/cleanup material required to cleanup a spill: Periodically treat area where unpolymerized acrylamide is used with 1.6% potassium persulfate, then with 1.6 % Sodium metabisulfite. Let stand for 30 minutes, then wash with plenty of water. Wear appropriate protective clothing. If potential respiratory hazard exists call OHS (ext. 8475). Collect spills into appropriate waste container. Avoid creation of airborne dust. Small liquid spill: Absorb with sand or other non-combustible absorbent materials and place into containers for later disposal. Treat site with 1.6% potassium persulfate, then with 1.6 % sodium metabisulfite. Let stand for 30 minutes, then wash with plenty of water. Small dry spill: Scrape material into clean, dry containers and cover. Do not create airborne dust. Treat site with 1.6% potassium persulfate, then with 1.6 % sodium metabisulfite. Let stand for 30 minutes, then wash with plenty of water. Large spill: Notify others in room of spill. Evacuate room/immediate area. Call OHS for cleanup (ext. 8475). Post room with warning notifying others of spill. Prevent unnecessary entry into area until arrival of OHS response team. Provide assistance and information to spill responders. Treat any spilled material as hazardous waste and dispose of through OHS.

If a spill is large or occurs outside of a fume hood, the laboratory occupants should immediately vacate the laboratory, close all doors and contact Occupational Health & Safety at 831-8475 during working hours or 911 after hours. If the laboratory personnel determine that the spill is not contained to the lab or could cause harm to people outside the laboratory, they should pull the building fire alarm and go to the Emergency Gathering Point to await the University Police and Emergency Responders. The responsible/knowledgeable person should provide the University Police and the Emergency Responders with the following:

1. Common Name of the Material Involved
2. A copy of a MSDS, if possible
3. Any pertinent information related to the emergency, such as location in the lab, other hazards in the lab, etc.

G. Emergency Phone Numbers:

Below are a list of emergency numbers to contact in the event of an emergency:

1. Police, Fire or Medical Emergency, call – 911 on the Newark Campus, 9-911 for all others
2. Occupational Health & Safety – X8475

Please provide a list of other emergency phone numbers, such as after hour contacts for laboratory personnel or any other important phone number, to be used in the event of an emergency: _____

H. Other Special precautions

Please list any other special precautions or procedures not listed in the above sections. Please be as specific as possible: _____

I. Chronic Exposure Hazards

Principal routes of exposure are usually by skin contact/absorption and inhalation of generated dust. Repeated or prolonged exposure to acrylamides may result in polyneuropathy that is insidious and distal in onset. The presence of ataxia and, occasionally, dysarthria and tremor suggests central midbrain involvement. Signs and symptoms include weakness, paraesthesias, fatigue, lethargy and decreased pin sensation, vibratory loss, decreased reflexes and positive Romberg sign. Severity is worst in distal portions of the extremities. Desquamation of the palms and soles, sweating and peripheral vasoconstriction are prominent. Recovery typically occurs within several months to a year of cessation of exposure although

severe exposures may result in permanent dysfunction. The relationship between neurotoxicity and reproductive toxicity for acrylamide and several of its congeners was studied to evaluate the effects in a second generation born of exposed parents dosed from weaning to mating. Dominant lethal effects and neurotoxicity were induced in male rats, with minimal or no effects in females. Depending on the compound, greater effects may or may not be observed in the second generation Chapin, R.E. et al; Fundamental and Applied Toxicology, 27, 9-24, 1995.

Section VI – Waste Disposal

The authorized person using this material is responsible for the safe collection, preparation and proper disposal of waste unless otherwise stated below. Waste shall be disposed of as soon as possible and in accordance with all laboratory and University procedures. All personal must obtain chemical waste disposal training via DOHS.

Specific instructions: Liquid waste will be placed inside a Nalgene waste container. The nalgene container will have a safety waste funnel attached to it. The safety funnel has a hinged cover to keep emissions contained and spills to a minimum. This container also has a built in vent to minimize overflow. A "JustRite" waste container can also be used. This material should be appropriately labeled with the name and the quantity. Solid waste that is unable to go into a nalgene container should be placed into a 6 mil poly bag or triple bagged into the normal trash bags. The bagged material should then be appropriately labeled with a hazardous waste label and set aside for pick up by the Department of Occupational Health & Safety. Reagent dry acrylamide as well as solutions or gel should be labeled with a hazardous waste label. Dispose of waste through Occupational Health & Safety.

Section V – Signature and Verification

Your signature below indicates that you have completed this form accurately to the best of your knowledge, you acknowledge all requirements and restrictions of this form and that you accept responsibility for the safe use of the material.

1. Prepared By: _____

Date: _____

Signature: _____

2. Principal Investigator: _____

Date: _____

Signature: _____

Section VI – Approval Process

A. University Chemical Hygiene Officer Approval

The Principal Investigator should have this form completed as accurately as possible. Please e-mail or fax this form to the University Chemical Hygiene Officer at eich@udel.edu or 831-1528. The Chemical Hygiene Officer will review and verify the form and make any necessary changes or updates.

1. University CHO: _____ Date: _____

Signature: _____

B. Conditional Approval to Purchase and Use

This form will then be e-mailed or faxed to a member of the University Chemical Hygiene Committee (CHC), usually from the same department as the requesting PI. The Committee Member will meet with the Principal Investigator or designee and discuss the form and the use of the material. If the Committee Member finds the procedure acceptable, they can offer a conditional approval for purchase and use of this material.

2. CHC Member: _____ Date: _____

Signature: _____

C. Full Approval

A signed copy of the form will be sent, via campus mail, to the University Chemical Hygiene Officer, who will bring it up at the next Chemical Hygiene Committee Meeting for full approval. All approvals will be good for two years. The complete, signed approval form will kept on file with Occupational Health & Safety and a copy will be sent to the Principal Investigator to keep on file.

3. Acceptance: _____ Date: _____

CHC Chair: _____

Signature: _____

D. Approval Expiration

The approval for use and purchase of this material will expire should any of the approved information change, with the exception of Section II, B and C, Authorized Personnel and Storage Location, or two years after CHC approval. If, at the end of two years, the procedure is substantially the same, the Principal Investigator can complete a renewal form and send it to the University CHO, who can approve the renewal for an additional two years.

CHECKLIST FOR POSSESSION AND USE OF CARCINOGENS AND HIGHLY TOXIC MATERIALS

The checklist is provided to assist a researcher with the approval process for possession and use of carcinogens and highly toxic materials. This form may be kept on file in the laboratory with the SOP to serve as documentation. The complete procedure can be found in the University Chemical Hygiene Plan in Chapter 12.

Date and Initial	
_____	1. Complete a Standard Operating Procedure/Approval Form For Carcinogens and Highly Toxic Materials and submit this form to OHS for review
_____	2. Review and make OHS's changes and recommendations
_____	3. Meet with a member of the University Chemical Hygiene Committee to review the approval form and the use of the material.
_____	4. Submit (via campus mail) the completed and signed form back to the University Chemical Hygiene Officer for conditional approval to purchase and use the material. The University Chemical Hygiene Committee will review this form at the next scheduled meeting for full approval.
_____	5. Complete a Job Hazard Analysis (JHA) for each experiment in which this compound is used. These JHAs must be kept on file in the laboratory and updated every 5 years or when a process changes.
_____	6. Provide and document training for every worker who will use the material. Training shall include hands-on instruction as well as review of the JHA, SOP and the University Chemical Hygiene Plan; specifically Chapter 12.
_____	7. Conduct a trial run with OHS present.
_____	8. Have OHS present the first time a process using this material occurs.