



Reactive Chemicals

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

Description

This standard operating procedure outlines the handling and use of reactive chemicals. 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 reactive chemicals.

Reactive chemicals are defined as those substances which can, in contact with air, water or other common substances, vigorously or violently give off heat, energy or toxic gases or vapors.

Potential Hazards

Reactive chemicals react vigorously with moisture or oxygen or other substances.

Engineering Controls

Many reactive chemicals will ignite or liberate combustible gas when exposed to water vapor or air. The use of a fume hood is recommended to prevent the buildup of flammable gases.

Special ventilation may be required if these materials are used outside a fume hood. If your research does not permit the handling of reactive chemicals in a fume hood you must contact Environment, Health and Safety (EHS) at (810) 766-6763 to review the adequacy of all special ventilation.

A glove box may be used to handle reactive chemicals if an inert or dry atmosphere is required.

Where the eyes or body of any person may be exposed to reactive chemicals, suitable facilities for quick drenching or flushing of the eyes and body shall be provided within the work area for immediate emergency use. Bottle type eyewash stations are not acceptable.

Work Practice Controls

Designate areas where reactive chemicals are stored and manipulated.

Containers: All reactive chemicals must be clearly labeled with the correct chemical name. Handwritten labels are acceptable; chemical formulas and structural formulas are not acceptable.

Hazard assessment of work involving reactive chemicals should address proper use and handling techniques, fire safety (including the need for Class D fire extinguishers), storage, the specific reactive nature of the material (such as water and air reactivity), and waste disposal issues.

Personal Protective Equipment (PPE)

Safety shielding is required any time there is a risk of explosion, splash hazard or a highly exothermic reaction. All manipulations of reactive chemicals that pose this risk should occur in a fume hood with the sash in the lowest feasible position. Portable shields, which provide protection to all laboratory occupants, are acceptable.

Lab coats, closed toe shoes, long pants, and long sleeved clothing must be worn when handling reactive chemicals. Additional protective clothing should be worn if the possibility of skin contact is likely.

Gloves must be worn when handling reactive chemicals. Disposable nitrile gloves provide adequate protection against accidental hand contact with small quantities of most laboratory chemicals. Lab workers should contact EHS for advice on chemical resistant glove selection when direct or prolonged contact with hazardous chemicals is anticipated.

Eye protection in the form of safety glasses must be worn at all times when handling reactive chemicals. Ordinary (street) prescription glasses do not provide adequate protection. Adequate safety glasses must meet the requirements of ANSI Z.87.1 and must be equipped with side shields. Safety glasses with side shields do not provide adequate protection from splashes; therefore, when the potential for splash hazard exists, other eye protection and/or face protection must be worn.

Transportation and Storage

Reactive chemicals should be stored in a cool and dry location. Keep reactive chemicals segregated from all other chemicals in the laboratory. Minimize the quantities of reactive chemicals stored in the laboratory.

Date all containers upon receipt. Examine storage containers frequently. Dispose of any container that exhibits salt build up on its exterior. Dispose of all reactive chemicals whenever they are no longer required for current research. Never return excess chemicals to the original container. Small amounts of impurities may be introduced into the container that may cause a fire or explosion.

Waste Disposal

All materials contaminated with reactive chemicals should be disposed of as hazardous waste. 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,

- Flush exposed eyes or skin with water (if the chemical is not water reactive) for at least 15 minutes, then seek medical attention (see below).
- Perform exposure first aid activities described in the SDS.

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.

TREATMENT FACILITIES:

<u>MAJOR INJURIES</u>	<u>MINOR INJURIES –During Business Hours</u>	<u>MINOR INJURIES –After Business Hours</u>
<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

Please refer to SDSs for specific guidelines for responding to spills. If uncertain, contact EHS for assistance and/or 911 for assistance. The following spill procedures may not apply to all reactive chemicals.

- When a spill occurs, **personal safety should always come first.**
- Alert and clear everyone in the immediate area where the spill occurred.

A **minor (small) chemical spill** is one of a known chemical that the laboratory staff is capable of handling safely without the assistance of safety and emergency personnel, i.e., less than 1 liter. A **major/large chemical spill** requires active assistance from emergency personnel.

Spill Response Steps:

MINOR CHEMICAL SPILL

- Alert people in immediate area of spill.
- If spilled material is flammable, turn off ignition and heat sources. Don't light Bunsen burners or turn on other switches.
- Open outside windows, if possible.
- Use proper personal protective equipment as indicated above.
- Avoid breathing vapors from spill.
- Confine spill to as small an area as possible.
- **Do not wash spill down the drain.**
- Use appropriate spill kits/inert, non-reactive sorbents to absorb spill. Collect contaminated materials and residues and place in container. Contact EHS at (810) 766-6763 for proper disposal.
- Clean spill area with water.

MAJOR CHEMICAL SPILL

Report large chemical spills greater than 1 liter in corridors or common areas, e.g., hallways, elevators, eating areas, rest rooms, offices, etc., to UM-Flint DPS at 911.

- Attend to injured or contaminated persons and remove them from exposure.
- Alert people in the laboratory to evacuate.
- If spilled material is flammable, turn off ignition and heat sources. Don't light Bunsen burners or turn on other switches.
- **Call University of Michigan – Flint Public Safety Department (DPS) at 911 immediately for assistance.**
- Close doors to affected area.
- Post warnings to keep people from entering the area.
- Have person available that has knowledge of incident and laboratory to assist emergency personnel.

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 reactive chemicals.

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 _____