Research
Research Laboratory & Safety Services

PO Box 245101
Tucson, AZ 85724-5101
Voice: (520) 626-6850
FAX: (520) 626-2583
rlss.arizona.edu

Corrosives Hazard Class
Standard Operating Procedure

1. Purpose

This standard operating procedure (SOP) is intended to provide guidance on how to safely work with corrosive chemicals in a University of Arizona (UA) laboratory. Laboratory personnel should review this SOP, as well as the appropriate Safety Data Sheet(s) (SDSs), before using corrosives. If you have questions concerning the requirements within this SOP, contact the Approval Holder (AH)/Approval Safety Coordinator (ASC), or the Research Laboratory & Safety Services (RLSS).

2. Scope

This hazard class SOP only addresses safety issues specific to the corrosive hazard of a chemical; several hazard class SOPs may be applicable for a specific chemical.

3. Hazard Description

Corrosive chemicals (i.e. acids and bases) cause visible destruction or permanent damage of skin or tissue at the point of contact. They can also be corrosive to metals. Corrosives can be liquids, solids or gases, and can therefore affect the skin, eyes and respiratory tract. Three general categories of corrosive chemicals exist: acids, bases, and dehydrating agents. Common examples of highly corrosive chemicals are hydrochloric acid, sodium hydroxide, chlorine gas, and phosphorous.

4. General Control of Hazards

The following general control measures should be implemented whenever using or handling corrosive chemicals:

- Wash hands thoroughly after handling corrosive chemicals.
- Do not breathe dusts or mists if inhalable particles may be created during use.
- Do not pour water into a liquid corrosive. Slowly add the corrosive to the water and stir.

5. Engineering Controls

Corrosive chemicals should be used in a chemical fume hood when used in high concentrations, or when the chemical, or reactions with the chemical, may produce an airborne hazard such as a gas, mist or fume.

6. Personal Protective Equipment

At a minimum, all laboratory workers must wear safety glasses, long pants, closed-toed shoes, a laboratory coat and examination gloves when working with hazardous chemicals in a laboratory.

Laboratory personnel working with large quantities of corrosive chemicals, or with any quantity in a way that may generate a splash hazard, must wear splash goggles instead of safety glasses. Chemical-resistant gloves may be necessary if working with corrosive chemicals in high quantities or for an extended period

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of time. Refer to the Personal Protective Equipment Selection Guide on the RLSS website for further information on appropriate chemical-resistant gloves.

7. Handling and Storage Requirements

Liquid acids and based may react violently with one another if they come into contact, depending on their strength and concentration. Concentrated, strong liquid acids and bases must be stored in corrosion-resistant secondary containment that can hold the full amount of chemicals being stored. Secondary containment may be built into the storage location (i.e. approved corrosive cabinets) or may be added to a storage area (e.g. plastic trays or Tupperware). Segregate concentrated strong acids and bases from each other, either in separate cabinets or with secondary containment. Nitric acid should be stored in separate secondary containment from other concentrated acids, such as acetic acid and hydrochloric acid.

Corrosive materials (acids and bases) must be stored below eye level, and should not be stored in flammable storage cabinets (with the exception of organic acids such as acetic acid, lactic acid and formic acid, in which case secondary containment is required). The corrosive materials may cause serious damage to the flammable cabinet and the other chemicals inside. Corrosives should be stored in separate areas from organic chemicals and flammable/combustible materials. Large quantities of corrosive chemicals should be stored in specially designated corrosive-resistant cabinets. It is recommended to label the outside of corrosive cabinets with hazard warnings, such as "Acids," "Bases" or "Corrosives."

8. Waste Disposal

Dispose of corrosive chemicals as aqueous hazardous waste (unless they are contaminated with other non-aqueous chemicals), in appropriate waste containers (i.e. plastic 3.5 gallon buckets) and segregated from incompatible chemicals. Contact Risk Management Services for further information on the disposal of hazardous chemicals.

9. Spill and Incident Procedures

Laboratory personnel may clean a small spill of corrosive chemicals themselves, as long as appropriate neutralizing materials (i.e. sodium bicarbonate for acids and citric acid for bases) and personal protective equipment are on hand, and workers have appropriate training. Neutralizing materials must be added to the spill slowly; the neutralization reaction may be exothermic (heat producing), and can cause more damage than the original spill if it occurs too rapidly. Once the addition of more neutralizing material does not generate signs of a reaction (i.e. heat, bubbling, etc.), the spill may be swept up and disposed of as hazardous waste.

If the spill of corrosive chemicals is large or contains a reactive mixture, do not attempt to clean the spill yourself. Evacuate the area and follow the procedures in the University Chemical Hygiene Plan section on major chemical spills. Inform the RLSS of all major chemical spills.

If a laboratory worker is injured or exposed to corrosive chemicals, immediately notify the AH/ASC; call 911 if the laboratory worker needs immediate medical attention. Remove contaminated clothing and immediately flush the contaminated areas with water for at least 15 minutes. For eye exposures, immediately remove contact lenses, if present, and flush the eyes with water for at least 15 minutes.

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Due to the high hazards associated with certain corrosive chemicals, additional safety precautions may be required in the laboratory, including the application of antidotes (e.g. calcium gluconate for HF gas). Consult the chemical's SDS for more specific information on appropriate first aid. Inform the RLSS and Risk Management Services of the incident as soon as practicable.

10. Designated Area

Designated areas are not required for this hazard class. However, chemicals may belong to multiple hazard classes, and a corrosive chemical may require a designated area if it belongs to a hazard class that includes particularly hazardous chemicals (e.g. hydrofluoric acid).