

Corrosives

Chemical Hazards and Risk Minimization

Before starting any work with hazardous materials, review the SDSs of the specific chemicals

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Corrosives

Corrosives are chemicals that deteriorate metals and/or produces potential irreversible skin tissue damage. Corrosives are identified with the Corrosion pictogram.

Section 2 of the Safety Data Sheet (SDS) will contain one or more Hazard Statements describing the nature of the corrosive chemical. Examples:

- *May be corrosive to metal*
- *Toxic in contact with skin*

**See the "Hazard Statements" fact sheet for more detailed information



Hazard Communication

The "Corrosion" pictogram identifies substances that may cause:

- **Skin corrosion/burns** - irreversible destruction of skin tissue, namely, visible necrosis through the epidermis and into dermis after exposure to a substance or mixture.
- **Eye damage** - refers to the production of tissue damage in the eye, or serious physical decay of vision, which is not fully reversible, occurring after exposure of the eye to a substance or mixture.
- **Corrosion to metals** - chemical action induced by a substance or mixture that will materially damage, or even destroy, metals.



Eye damage



Metal corrosion

What do I need to know?

- **ALWAYS add acid TO water**, not the reverse
- Follow general safe chemical handling/storage practices as outlined in the ECU CHP and manufacturer SDS
- Substitute for less hazardous chemicals where possible
- Use chemicals on the smallest scale and concentration feasible
- Wear proper PPE when handling corrosive chemicals. Be aware of the strength and concentration of the solutions handled.
- Know the location of closest eyewash station and safety shower

Handling and Storage Precautions

General risk mitigation measures are as follows:

- Review instructions and precautions provided by the manufacturer/distributor with respect to recommended storage and handling.
- Store by hazardous class and in secondary containment. Clearly label storage location and/or secondary containment with hazard class.
- Follow general safe chemical handling practices as outlined in the ECU Chemical Hygiene Plan (CHP)
- Observe all specific safety procedures established in the lab safety plans.



- Wear appropriate personal protective equipment (PPE) including a closed lab coat, closed heeled/toed, non woven shoes, eye protection, and compatible gloves.
- For dilute solutions (less than 3M), use standard nitrile gloves; up to 6M solution use Viton, thicker nitrile, or double glove; for more concentrated solutions to concentrated commercial grade use laminate film material, neoprene, or polyvinyl chloride gloves.
- Substitute for less hazardous chemicals where possible.
- Use chemicals on the smallest scale and concentration feasible.
- Store the minimal amounts necessary.
- Where possible, purchase liquid corrosives in shatter proof bottles
- When possible, use dilute solutions of corrosives to reduce how rapidly they can damage tissue.
- Always add acid to water, and not the reverse. When making initial dilutions of concentrated acids, use cold water (i.e. in an ice bath) and keep the water mixing during the addition. Make additions to the center of the container so that the heat is most rapidly dispersed.
- Strong acids that are also oxidizers (nitric acid, sulfuric acid) may react violently with organic compounds.
- Use a fume hood for any work involving corrosive gases, liquids that produce corrosive vapors, operations that generate vapors, mists, or corrosives dusts.
- Know what actions to take in the event of an exposure. Review lab safety plans before use.

Strength and Concentration

These two concepts both influence the pH of a solution and the hazardousness of a corrosive material.

- *Strength* - the percentage of ionization that occurs when an acid or base is mixed with water, expressed in terms of weak and strong
- *Concentration* - the amount of acid or base that is mixed with a certain amount of water (a ratio of material to water), expressed as a weight or volume ratio

Hazard to Tissue

Strong acids and bases are so corrosive that even momentary exposure to the skin will produce severe damage. Weak acids and bases can also produce severe corrosion of the skin, but generally require higher concentrations or longer contact times. Acids and bases damage tissue in different ways. Acids generally damage proteins while bases dissolve both proteins and fats. Damage from acids is generally felt at the outset of exposure. Damage from bases may not become painful for some time. Because bases act on both proteins and fats and are not as immediately painful, exposure to bases can cause more damage.

Resources

- [GHS Handbook, Revision 7 \(The Purple Book\)](#)
- [GHS Pictogram \(OSHA Quickcard\)](#)
- [Safety Data Sheet Information](#)
- [How to Read a Safety Data Sheet](#)



Few drops of a highly corrosive chemical - Oleylamine - on forearm. Chemical burn appeared hours later eventually requiring treatment at hospital.