

Corrosives (Acids and Bases)

General Characteristics

- Corrosives are most commonly acids and bases.
- Corrosives can damage tissue. Inhalation of the vapor or mist can cause severe bronchial irritation. Corrosives are particularly damaging to the skin and eyes.
- Certain substances considered non-corrosive in their natural dry state are corrosive when they contact moist skin or mucus membranes. Examples include lithium chloride, halogen fluorides, and allyl iodide.
- Sulfuric acid is a very strong dehydrating agent while nitric acid is a strong oxidizing agent. Dehydrating agents can cause severe burns to the eyes due to their affinity for water.
- Examples of Corrosives
 - Sulfuric Acid
 - Chromic Acid
 - Ammonium Hydroxide
 - Bromine

Use and Storage of Corrosives

- Acids and bases should always be stored separately. Store acids in acid storage cabinets or plastic secondary containment away from flammables, as many acids are also strong oxidizers.
- Do not work with corrosives unless an emergency shower and eyewash are available within 10 seconds travel time.
- Add acid to water, but never add water to acid.
- Do not store liquid acids above eye level. Store on a low shelf or inside a cabinet.
- Store acids in a plastic tray, tub or rubber bucket to contain any leakage
- Purchase corrosives in containers that are plastic or plastic coated.
- Acids should be stored in an acid cabinet or cabinet with corrosion-resistant lining. Acids stored in an ordinary metal cabinet will quickly corrode the interior. If an acid cabinet is not available, store the corrosive in a plastic tub or wooden cabinet. Never store corrosives in a flammable liquid cabinet.
- Nitric acid should always be stored away from other acids and organic materials due to its high reactivity.

Use and Storage of Hydrofluoric Acid

- Laboratories using hydrofluoric acid should have SOPs giving specific procedures for usage and safety.
- Hydrofluoric acid can cause severe burns. Inhalation of anhydrous hydrogen fluoride can be fatal. Initial skin contact with hydrofluoric acid may not produce any symptoms. However, hydrofluoric acid can scavenge calcium from skin and bones, causing severe injuries.
- Always use hydrofluoric acid in a properly functioning fume hood, and wear personal protective clothing.

- If you suspect that you have come in direct contact with hydrofluoric acid, wash the area with water for at least 5 minutes, and then apply specifically formulated cream. Remove contaminated clothing and seek medical attention. If hydrogen fluoride vapors are inhaled, move the person immediately to an uncontaminated atmosphere (if safe to do so) and seek prompt medical attention.
- Never store hydrofluoric acid in a glass container as it is incompatible with glass. Hydrofluoric acid usually comes in a plastic bottle.
- Store hydrofluoric acid separately in an acid storage cabinet and keep only the amount necessary in the laboratory.
- Creams, such as calcium gluconate, are commercially available and specifically formulated to treat hydrofluoric acid exposure.

Health Hazards Associated with Corrosives

- Acute Health Effects
 - Inhalation causes irritation of mucus membranes; difficulty in breathing; fits of coughing; pulmonary edema ingestion; irritation and burning sensation of lips, mouth, and throat; pain in swallowing; swelling of the throat; painful abdominal cramps; vomiting; shock; and risk of perforation of the stomach.
 - Skin contact results in burning, redness and swelling, painful blisters, profound damage to tissues and (with alkalis) a slippery soapy feeling.
 - Eye contact will cause stinging, watering of eyes, swelling of eyelids, intense pain, ulceration of eyes, loss of eyes or eyesight.
- Chronic Health Effects
Chronic exposure symptoms vary greatly depending on the chemical. For example, the chronic effect of hydrochloric acid is damage to the teeth. However, the chronic effects of hydrofluoric acid are decreased bone density, fluorosis, and anemia.
- All corrosives possess the property of being severely damaging to living tissues. Acids also react with other materials such as metals.
- Skin contact with alkali metal hydroxides (e.g., sodium hydroxide and potassium hydroxide) is more dangerous than with strong acids. Contact with base metal hydroxides normally causes deeper tissue damage because there is less pain than with an acid exposure. The exposed person may not wash it off thoroughly enough or seek prompt medical attention.
- All hydrogen halides are acids that are serious respiratory irritants and cause severe burns.

First Aid

- For inhalation, remove person from source of contamination if safe to do so, and then seek medical attention.
- For ingestion, remove person from source of contamination. Seek medical attention and inform emergency responders of the chemical swallowed.

- For skin contact, remove person from source of contamination and take immediately to an emergency shower or source of water. Remove clothing, shoes, socks, and jewelry from affected areas as quickly as possible, cutting them off if necessary. Be careful not to get any chemical on your skin or to inhale the vapors. Flush the affected area with water for a minimum of 15 minutes, and then seek medical attention.
- For eye contact, remove person from source of contamination and take immediately to eyewash or other source of water. Rinse the eyes for a minimum of 15 minutes. Have the person look up and down and from side to side. Get medical attention. Do not let the person rub their eyes or keep them tightly shut.

Personal Protective Equipment

Always wear the proper gloves when working with corrosives. Neoprene and nitrile gloves are effective against most acids and bases. Polyvinyl chloride (PVC) is also effective for most acids. A rubber-coated apron and goggles should be worn. If splashing is likely to occur, wear a face shield over the goggles. Always use corrosives in a chemical fume hood.