



STANDARD OPERATING PROCEDURE

ACID NEUTRALIZATION

College/Dept: BSU Colleges, Departments, Laboratories

Building/Room:

Laboratory Name:

Revision: 3.0

Approval

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Overview

Corrosive chemicals such as acids and bases are considered hazardous wastes when disposed. However, some of these chemicals may be neutralized in the laboratory and safely disposed via the sewer. When neutralized in the laboratory at the point of waste generation, the neutralized solution is not considered a hazardous waste and therefore reduces disposal costs.

Scope

This document only applies to hydrochloric, sulfuric acid, acetic acid, and phosphoric acid in quantities less than 2 gallons. Neutralization of other chemicals and quantities greater than 2 gallons must be approved by Environmental Health, Safety and Sustainability (EHSS).

Potential Hazards

- Chemical
 Thermal
 Hydraulic
 Electrical
 Slip/Trip
 Biological
 Mechanical
 Radiation
 Pneumatic
 Fire
 Fall
 Other

Hazard Specifics: Chemical - Mixing acids and bases; Thermal – Heat of reaction

Engineering Controls (EC)

- Fume hood
 Biosafety Cabinet
 Other Local Exhaust
 Shielding
 Other

EC Specifics: Standard certified chemical fume hood

Training Requirements – except for classroom lab safety, must be completed prior to performing the procedure

- Classroom Laboratory Safety Awareness
 Radiation Worker
 Online Safety Topics
 (specify): Hazard Communication, Chemical Hygiene Plain, Hazardous Waste
 Lab/Work Group Specific Training
 (specify): Document review of SOP

ACID NEUTRALIZATION

Other (specify):

Personal Protective Equipment (PPE)

- | | | | |
|----------------------------------------------|----------------------------------------------------|-------------------------------------------------------|------------------------------------------------------------------|
| <input type="checkbox"/> Safety glasses | <input checked="" type="checkbox"/> Safety goggles | <input type="checkbox"/> Face shield & safety glasses | <input checked="" type="checkbox"/> Face shield & safety goggles |
| <input checked="" type="checkbox"/> Lab coat | <input checked="" type="checkbox"/> Apron | <input type="checkbox"/> Tyvek suit | <input type="checkbox"/> Tyvek sleeves |
| <input checked="" type="checkbox"/> Gloves | <input checked="" type="checkbox"/> Leg coverings | <input type="checkbox"/> Hard hat | <input type="checkbox"/> Hearing protection |
| <input type="checkbox"/> Respirator | <input checked="" type="checkbox"/> Shoes | <input type="checkbox"/> Fall protection | <input type="checkbox"/> Other |

PPE Description: Gloves - Nitrile or neoprene, ≥ 16 mil, covering forearms;

Safety goggles – Indirect venting;

Leg coverings – no exposed skin (e.g. pants);

Shoes – Closed Toe

Additional PPE is required for a process where splash potential is probable - Apron – acid resistant; Face shield

Equipment, Materials, Supplies, & Facility Requirements

- Potassium hydroxide, 1M OR sodium hydroxide 1M OR sodium carbonate
- Compatible container of sufficient size for quantity of acid, dilution water or ice, and neutralizing solution
- pH paper or pH meter
- Compatible stir stick

Handling, Work Area & Storage Requirements

If it is necessary to perform outside of a fume hood, a face shield must be worn during steps 1 and 2.

Emergency Response Equipment & Supplies

- | | | | |
|---------------------------------------------------|--------------------------------------------|-----------------------------------------------|---------------------------------------------------------|
| <input checked="" type="checkbox"/> Eyewash | <input type="checkbox"/> Fire extinguisher | <input type="checkbox"/> First aid kit | <input type="checkbox"/> Calcium gluconate gel (HF use) |
| <input checked="" type="checkbox"/> Safety shower | <input type="checkbox"/> Fire blanket | <input checked="" type="checkbox"/> Spill kit | <input type="checkbox"/> Emergency gas shutoffs |
| <input type="checkbox"/> Drench hose | <input type="checkbox"/> Other: | | |

Description: Spill kit suitable to neutralize and clean up an acidic spill.

Decontamination & Waste Disposal

- Neutralization and disposal of hydrochloric, sulfuric acid, acetic acid, and phosphoric acid in quantities less than 2 gallons must be performed as outlined in the Procedures section.
- Maintain a log of neutralized waste (see below).
- Neutralization of other chemicals or quantities greater than 2 gallons must be approved by EHSS

Additional Safety Information

Review of applicable safety references such as safety data sheets to ensure appropriate protective measures, spill supplies, and first aid procedures.

For assistance or questions regarding this SOP (e.g. PPE), contact EHSS at 6-3906 or 6-3303.

ACID NEUTRALIZATION

Procedure

REQUIRED Engineering Controls (EC) & PPE*

Chemical fume hood; Lab coat; Safety goggles – indirect venting; Gloves - Nitrile or neoprene, ≥ 16 mil, covering forearms; Leg coverings – no exposed skin (e.g. pants); Shoes – Closed Toe

Additional PPE for processes where splash potential is probable: Apron – Acid resistant; Face shield

* Applicable to all steps and substeps unless otherwise noted.

STEPS

1. Slowly add acid to a container of cold or ice water to form a 1:10 dilution of acid to water.	
2. Slowly add a 1M potassium hydroxide solution, 1M sodium hydroxide solution, or sodium carbonate while stirring until the pH is in the range of 6.0 to 9.0. a. If the pH exceeds 12.0, slowly add 1M hydrochloric acid solution or citric acid until the pH is between 6.0 and 9.0.	
3. Flush down the drain with an excess of cold water.	
4. Complete the Waste Neutralization Log (a template is available on the EHSS website).	No EC or PPE required unless required by laboratory or if another hazard is present.