Standard Operating Procedure

For work with *NEUTRALIZATION OF AQUEOUS ACID/BASE-WASTE.*

PI: Andreas Franz					**Building(s): CR**
PI Signature:					**Room Number(s):** 116
Revision/Review Date:					**Designated Work Area: Research Laboratory**
Departmental Approval?	**Yes**	☑	**No**	☐	**Departmental Signature:** Jianhua Ren
EH&S Approval?	**Yes**	☐	**No**	☐	**EH&S Signature:**

Instructions for each section of this form are available and should be referenced as you complete this SOP form. If an experimental protocol has been written and incorporates all of the relevant safety information required in this form, it can be used (only with Department and EH&S approvals) in lieu of this template.

Summary (Overview):

The procedure describes the neutralization of aqueous acid/base-waste. Researchers will be able to apply the procedure to safely dispose of neutral aqueous solutions.

1. Hazard Identification

a. Preparation and Use:

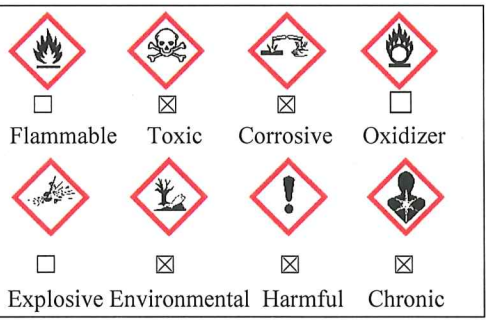
Procedures used: Benchtop or fume hood.
The procedure will be applied to waste as it accumulates in the laboratory because of routine daily research activities.

Note: If identified as a **process**, provide additional detailed procedural steps for the use of **each** hazardous chemical in **Section 5**, below.

b. Chemical Hazards and Risk:

Acid/Base waste is corrosive and can have severe and potentially fatal effects for individuals exposed to it. Environmental hazard is high as well.

Please list the CAS#:



c. Equipment Hazards and Risk:

N/A

2. Hazard Control

a. **Chemical Selection and Purchasing:**

Chemical usage and purchasing shall be planned such that:

- The safest chemical to accomplish the job shall be chosen
- Open bottles and those closest to expiration shall be chosen over opening new bottles
- The surplus inventory will be checked before making any purchases
- Purchases shall be limited to the amount needed that can be used within one year.

Additional Instructions: add additional instructions as needed

b. **Engineering Controls:**

When hazards cannot be eliminated or reduced through substitution, determine if additional engineering controls can be used to reduce risks (fume hoods, flammable cabinets, limited access, etc.).

Additional Instructions: add additional instructions as needed

c. **Administrative and Work Practice Controls:**
When hazards cannot be effectively controlled through engineering, determine if additional administrative and work practice controls can be used to reduce risks (procedures, chemical segregation, etc.).

Additional Instructions: add additional instructions as needed

d. **Personal Protective Equipment (PPE):**

☒ Long Pants ☒ Lab Coat ☒ Gloves ☒ Safety Glasses

☒ No Open Toed Shoes ☐ Face Shield ☐ Respirator

Other PPE Required:

☐ Chemical splash goggles ☐ Blast shield

☐ Chemical-impervious gloves ☐ Fire resistant gloves

☐ Fire resistant lab coat ☐

Other (please describe):

e. **Storage and Transportation:**
When storing chemicals, utilize the proper equipment for the hazard of the chemical. i.e., flammable cabinet, explosion proof refrigerators, corrosive cabinets, acid cabinets, etc. Moving hazardous waste or chemicals between rooms or buildings with quantities greater than 500 mL shall be carried in a chemical-resistant tote that offers secondary containment and impact protection.

Additional Instructions: add additional instructions as needed

3. **Emergencies, Spill Procedures, and Exposures/Unintended Contact**
Use absorbent materials to contain and absorb small liquid spills. All such absorbent material shall be placed in the proper container and contact Risk Management for disposal. If there is a large spill, contact Public Safety 6-3911 or (209) 946-3911 and Risk Management 2-3011 or (209) 932-3011, evacuate the room and close the door. If there is unintended exposure and contact to a chemical on the skin, remove and bag any contaminated clothing and utilize the eyewash or emergency shower to rinse contaminated skin for 15 minutes. For immediate or emergency medical attention, transport by ambulance to the Emergency Department at St. Joseph's Hospital located at 1800 N. California St. Stockton, CA. 95204. If feasible, provide the SDS for the chemical to the paramedics.

Additional Instructions: add additional instructions as needed

4. **Waste (Procedures, Storage, and Disposal):**
Hazardous Waste must be properly labeled and may be stored in a designated Satellite Accumulation area for up to 9 months. One container per waste stream is permitted at a time. When the container becomes full or reaches its 9 month accumulation limit, request a waste disposal pickup by emailing Risk Management riskmanagement@pacific.edu.

Additional Instructions: add additional instructions as needed

5. **Details of Process**

Any waste in the laboratory that has been identified as acidic (pH < 7) or basic (pH > 7) must be neutralized to pH 7.
The solution shall be neutralized in a wide-neck container (e.g. beaker) that is not filled more than 50% of its total volume.
During neutralization, add only small quantities of acid/base (as appropriate) to the solution to be neutralized. Stir the solution continuously (can be manually with glass rod or mechanically with a magnetic stirring plate or slow shaker).
In case concentrated acids or bases have to be neutralized, monitor the temperature of the solution to be neutralized and provide adequate cooling (ice bath) if needed. This prevents overheating, boiling and overflowing of the solution out of the container.
Progress of neutralization should be monitored with small samples applied to general-purpose pH-paper until green (pH 7).

Hazard-free salt solutions, e.g. HCl + NaOH results in salt water, can be discarded down the drain.
Hazardous salt solutions, e.g. heavy metal salt solutions such as Ni, Cr, Pb, etc., MUST be collected in the aqueous waste container in the laboratory.
IF NOT SURE, ASK SUPERVISOR HOW TO DISPOSE.

6. Training

All personnel are required to complete all General Safety and Lab Safety training requirements and any additional training sessions specific to equipment and chemicals in the work area. PI's or Lab supervisors shall work with the EH&S and the Learning and Development Departments to ensure all necessary trainings are selected and completed by lab personnel.

Additional Training Required: add additional required trainings as needed

7. Prior Approval Requirements

☐	This task requires PI or Lab Supervisor approval prior to the start of this task, every time.
☐	This task is prohibited from being done when working alone in the lab.
☒	PI supervision is required until competency is achieved.
☐	This process and/or equipment is prohibited from being left unattended when in use.
☐	This task does not require PI or Lab Supervisor approval prior to the start of this task.

8. Training Record

"I have read and understand this SOP. I agree to fully adhere to its requirements."

Last	First	ID #	Signature	Date
FRANZ	Andrea	988-03-2705		05/07/20
Simmermaker	Cate	989285065	Cate Simmermaker	05/07/20
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