Standard Operating Procedure for Acid use in EMAL

Please note that Hydrofluoric Acid is not allowed in ANY EMAL laboratory space at anytime, anyone contravening this rule will not be allowed to use EMAL in future.

Acids used in EMAL.

Nitric
Sulphuric
Hydrochloric
Acetic
Small quantities of perchloric

Specified Hazards:
Harmful, corrosive, many acids cause severe burns to the skin and other tissues.

1. Purchasing and Bringing Acids to EMAL: If you bring acids to EMAL you should check that we have on-line access to the Material Safety Data Sheet (MSDS) for that particular acid. All EMAL users must have received standard OSEH training and received a Lab Safety Training Certificate or a letter signed by an OSEH representative. Users should familiarize themselves with the MSDS information before working with any acid.
Quantities of any acid should will be limited to the smallest amount necessary to complete the experiment or series of experiments.

2. **Storage:** Materials will be stored according to compatibility and label recommendations in a designated area: **EMAL Acid Cabinet** in 423 EMAL. Storage areas will be regularly inspected by the EMAL safety staff to ensure safety.

3. **Authorized Personnel:** Use will be limited to the following personnel (when properly trained):
   - EMAL Technical Staff
   - EMAL Users

4. **Training Requirements:** EMAL staff and user training should include the following:
   - Completion of OSEH Laboratory Safety Course
   - Review of current MSDS
   - Review of and use of safety equipment/protective clothing provided by the department
   - Review of the departmental safety procedures
   - Review of the **EMAL Chemical Hygiene Plan**

5. **Use Location:** Materials shall be used only in the following designated areas in EMAL: Room 423. All other uses must be cleared by the EMAL Staff.

6. **Personal Protective Equipment:** All personnel are required to wear the following personal protective equipment whenever handling acids: Face shield, Neoprene Gloves or Nitrile gloves, Lab Coat and Closed Shoes (absolutely no sandals, open toed or open healed shoes).
7. **Waste Disposal:** The authorized person using this material is responsible for the safe collection, preparation and proper disposal of waste unless otherwise stated below. Waste shall be disposed of as soon as possible and in accordance with all laboratory and University procedures.

Specific instructions: Neutralize waste acid with sodium bicarbonate or sodium bicarbonate solutions until a pH of 5.5 or higher is achieved. Drain dispose with large volume of water.

8. **Decontamination:** Specific instructions: Use a rag or paper towel with 5% sodium bicarbonate solution to decontaminate equipment or surfaces.

9. **Exposures:** Emergency procedures to be followed (from MSDS):
   
   **Skin Contact**
   
   Symptoms: Strong irritation, redness, burns.
   
   First aid: Flood areas in contact with acid with large amounts of water using a safety shower or eyewash for 15-20 minutes. Get immediate medical attention.

   **Eye Contact**
   
   Symptoms: Strong irritation, redness, burns.
   
   First aid: Flood areas in contact with acid with large amounts of water using a safety shower or eyewash for 15-20 minutes. Get immediate medical attention.

   **Inhalation**
   
   Symptoms: Severe irritation and burns of the respiratory tract.
   
   First aid: Get immediate medical attention. Remove exposed person to fresh air. Use a bag valve mask or similar device to perform artificial respiration if needed.

   **Ingestion**
   
   Symptoms: Burns of mucus membranes, vomiting, diarrhea
First aid: Get immediate medical attention. Do NOT induce vomiting. If vomiting occurs, keep head lower than hips to prevent aspiration. Give large amounts of water or milk.
(Note: Never make an unconscious person vomit or drink fluids.) If person is unconscious, turn head to side.

10. Spills: The acid spill cleanup is available in room 426 EMAL chemical room in the cabinet to the left of the door, marked, "SPILL KITS IN THIS CABINET". Gloves, face shield, lab coat, and neoprene apron should be used when cleaning up spills.
Wearing the personal protective equipment described above, sprinkle solid sodium carbonate or bicarbonate over the spill. Scoop up the spill mixture and place it in a sturdy plastic container such as a rubber bucket. In a fume hood slowly fill up the bucket with water. Add additional sodium bicarbonate with stirring until a pH of 5.5 or higher is obtained. Rinse the neutralized acid down the drain with large volumes of water.

11. Phone Numbers

UM Campus Police - 911 (accidents, spills)
or (734) 763-1131
Website: http://police.umich.edu

UM Occupational Safety and Environmental Health (OSEH)
Department
Phone: (734) 647-1143
Website: http://www.oseh.umich.edu/

12. Other: Incompatibilities: Remember many acids are incompatible with other acids, organic compounds and bases, as an example: acetic acid is incompatible with chromic acid, nitric acid, ethylene glycol, perchloric acid,
phosphorous trichloride, oxidizers, sodium peroxide, strong caustics, most metals (except aluminum), carbonates, hydroxides, oxides, and phosphates. Review the MSDS and other references concerning incompatible reactions.

**Responsibilities for those working with Chemicals in EMAL**

The EMAL Chemical Preparation Room (423 EMAL) has limited space and chemical compatibilities are always an issue. The EMAL staff shall:

- Maintain separate areas for storage of flammable and nonflammable chemicals.
- Examine stored chemicals periodically for deterioration and container integrity and inventory chemical stock on a regular basis.
- Ensure that incompatible chemicals are stored separately.
- Monitor chemical inventory at regular intervals to ensure that chemicals are properly stored and labeled. (A proper label includes a name, date, and detailed description of the contents.)
- Ensure that all liquid and solid chemicals are clearly labeled.
- Appropriately dispose of expired or deteriorated chemicals for chemical containers.
- Maintain First aid equipment, emergency shower, emergency eyewash, fire fighting and other safety equipment such as gloves, aprons, goggles and face shields.
• Ensure that all compressed gas tanks and fire extinguishers are routinely inspected.

**It is the Responsibility of any Staff Member or User who is using chemicals at EMAL to:**

• Properly store and label all of your chemicals. (A proper label includes a name, date, and detailed description of the contents).

• Sign in all chemicals you bring into CHESS.

• Know the **Standard Operating Procedures** for the chemicals you are working with.

• Ensure that there is access to MSDS's for chemicals you bring into EMAL.

• Notify the EMAL Staff of any hazardous or unusual chemicals you bring into EMAL.

• Familiarize yourself with your work area and note the location of emergency showers, eyewash stations, chemical fire extinguishers and first aid kits.

• Know proper for procedures for working in Fume Hoods.