CEM 444 Extra Credit

Compressed Gas Cylinder Safety
http://www.aware.msu.edu/TRAIN/C

Cryogen Safety
http://www.aware.msu.edu/TRAIN/C

Hazard Control Measures

• Engineering Controls: The work environment is designed to eliminate hazards or reduce exposure to hazards.

• Work Practices and Administrative Controls: Policies or procedures used to reduce employee exposure

• Personal Protective Equipment: Worn by the worker to protect against exposure to chemicals.

STANDARD OPERATING PROCEDURES

• Definition: A standard operating procedures (SOP) is set of written procedures explaining how to safely work with hazardous chemicals.

• Why SOP’s Are Required: In order to make the Chemical Hygiene Plan a legal document, principal investigators must add laboratory-specific procedures to the plan.

• When SOP’s Are Required: SOP’s are required additions to the Chemical Hygiene Plan in any laboratories engaging in activities not covered by the Chemical Hygiene Plan.

GUIDELINES FOR PREPARING SOP’s

Section 1: This standard operating procedure is for:

- The generic use of the specific chemical
- A specific laboratory procedure involving the chemical
Section 2: Chemical (s) to be used

State name of the material, physical properties, warning properties (if any) and MIOSHA exposure limit. If a mixture, state the percent, molarity or ppm of the acid component.

Section 3: Potential Hazards

• List physical and health hazards associated with the chemical(s), and/or toxic chemical intermediates of the acids. This should include any potential unintended reaction that may release toxic, flammable or corrosive gases.

• Suggested:
  • Product (M)SDS
  • NIOSH Pocket Guide to Chemical Hazards - http://www.cdc.gov/niosh/npg/

Section 4: Personal Protective Equipment (PPE)

• All work in laboratories must be performed under the guidelines for appropriate laboratory attire, as defined by the MSU Chemical Hygiene Plan:
  • Close-toe shoes
  • Long pants or long skirt covering the legs from the waist to the top of shoes
  • Safety glasses or goggles, as appropriate
  • Laboratory coat
  • Chemical resistant gloves
  • In addition, a face shield and chemical-resistant apron must be worn when quantities greater than 1 liter are manipulated, or when the potential for splash or spatter can occur.
  • State where PPE for this procedure can be found in the laboratory
  • Identify documentation that gloves used with the particular chemical(s) is appropriate and resistant.

Section 5: Engineering Controls

• Describe engineering controls that will be used to minimize potential exposure to chemicals, such as fume hoods, secondary containment vessels, containers, etc.

• Please note:
  • Eyewash and safety showers must be present and unobstructed

Section 6: Special Handling & Storage Requirements

• List storage requirements for the hazardous chemicals involved in the SOP, including specific storage areas, storage according to compatibility and policies regarding access to chemicals. Special procedures such as dating peroxide forming chemicals upon receipt, and opening and testing for peroxide formation after the appropriate date.

Section 7: Spill and Accident Procedures

• Indicate how spills or accidental releases will be handled and by whom. List the location of appropriate emergency equipment (spill kits, showers, eye washes, and fire equipment). Any special requirements for personnel exposure should also be identified in this section. Identify the location of emergency response phone numbers.

• Small spills <1 liter:

• Large spills >1 liter:
Section 8: Exposure Procedures

• If items such as glove boxes, hoods, lab benches and controlled areas have been contaminated by hazardous chemicals, remove chemical contaminants with appropriate solvents or cleaning solutions.

Section 9: Waste Disposal Procedures

Dispose of waste acids by submitting online waste pickup requests every 90 days to MSU EHS at: www.ehs.msu.edu. Collect waste in a suitable waste container or polypropylene carboy provided by MSU EHS. Ensure a completed waste tag is attached to the container at all times. Do not use metal containers.

Section 10: Material Safety Data Sheet Location

List location(s) of (M)SDS for the acid(s). This should include a printed copy in the laboratory in an easily accessible location.

Section 11: Training and Awareness and Protocol(s)

☐ Chemical Hygiene and Hazardous Waste Initial / Refresher
☐ Site Specific Training with PI or lab manager
☐ Review and signature of this completed SOP
☐ Other

• If appropriate, identify other employees in the vicinity who may be affected should an unintended reaction or release of acid occur. Describe how those employees will be notified of this experiment, the location of this SOP and (M)SDS, and point contact person available for questions.
• Summarize the process or experiment, including an estimate of how long the process takes and how frequently it will be conducted. Provide a general sequential description of work, including details such as amounts of acids used, special safety equipment utilized, pre-operational checks for leaks, etc.

Section 12: SOP Review and Prior Approval

• I, the PI/Supervisor, grant the following laboratory personnel approval to perform the above SOP
• Name: ____________________________________________
• Name: ____________________________________________
• PI/Laboratory Supervisor signature: _____________________Date: ____________

• I have reviewed and understood this Standard Operating Procedure, and agree to abide by the protocols described herein:
• Signature: _______________________________________Date: ____________
• Signature: _______________________________________Date: ____________
• Signature: _______________________________________Date: ____________