

# Healthcare and Energy Materials Laboratory

(E3 05-09, E3 05-10, E3 05-14, E3 05-15)

## Standard Operating Procedures (SOP)

### Chemical Safety

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Prepared by

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## 1. General

- ◆ Users must read the MSDS of the chemicals that he/she is using and be fully aware of its hazards, handling precautions and properties.
- ◆ MSDS and the chemical inventory in the lab can be found in the following webpage, [http://www.bioeng.nus.edu.sg/seeram\\_ramakrishna/Chemical\\_inventory/Chemical%20inventory%20HEM%20lab.htm](http://www.bioeng.nus.edu.sg/seeram_ramakrishna/Chemical_inventory/Chemical%20inventory%20HEM%20lab.htm)
- ◆ All prepared chemical solutions and materials must be labeled with your name, the date and chemical name. The label must be prominently displayed and clearly written on the outside of the container or package.
- ◆ Your name, the chemical and quantity of chemicals taken must be recorded in the inventory record sheet provided.
- ◆ Except chemicals classified as non-hazardous, all chemicals will be kept under lock. They will be unlocked from 9.30 am to 5.00 pm during office hours. Chemicals controlled under Poisons Act, Chemical Weapons Convention Act and Arms and Explosives Act will be kept under lock at all times. Keys to the cabinet containing chemicals controlled under Poisons Act and Explosives Act will be with the Professional Officer or Lab Technologist and key to cabinet containing chemicals controlled under Chemical Weapons Convention Act will be with the Principal Investigator (Prof Seeram Ramakrishna).
- ◆ Prepared chemicals/solution may only be kept in designated area (trays, cabinets, refrigerator etc.).

## 2. Basic Chemical Safety

- ◆ Always wear appropriate gloves and personal protective equipment (PPE) when handling chemicals and performing experiment.
- ◆ Never draw liquids by mouth when using a pipette. Use a safety bulb attachment.
- ◆ All preparation involving exposed solvents must be carried out in the fumehood.
- ◆ All chemical reagent bottles must be wiped dry of any spillage on it and put back to the allocated shelves or spaces immediately after use.
- ◆ Reject all cracked glassware.
- ◆ Always use both hands when carrying chemical reagent bottles. Support the bottle by their base.
- ◆ All chemicals must be carried in a secondary container outside the laboratory.

### 3. Chemical Waste Handling and disposal of contaminate materials

- ◆ Never dispose hazardous chemicals down the drain, sink or in the general trash bin in the lab.
- ◆ All chemical waste must be stored in waste bottles with the chemical name clearly labeled.
- ◆ All chemical waste bottles must be kept in designated area.
- ◆ Any material contaminated with solvents or containing solvent residues must be left in a fumehood to allow all the solvents to vaporize before disposal into the bin.
- ◆ Any non-sharp materials (eg. gloves, tissues) contaminated with solvents must be thrown into the designated plastic beaker within the fumehood

#### a) Sharp-waste disposal

- Any needles and sharps contaminated with solvent must be thrown into the designated glass beaker within the fumehood.
- Sharps, including needles, syringes, slides, glass pasteur pipettes, capillary tubes, broken glass and scalpel blades, should be disposed into containers labeled as “SHARPS” after it is free of solvent vapors.
- Contaminated needles should not be broken or clipped unless the clipping device can effectively control the aerosol generation. Needles shall not be recapped or separated from syringes prior to disposal.
- Sharps containers shall remain closed at all times except when sharps are being deposited into the container. Sharps containers shall not be placed on the floor in the lab at all times. Sharps containers shall not be filled beyond the recommended fill line.

### 4. Fumehood

- ◆ Turn on the fumehood fan 5 minutes before operation
- ◆ Place equipment at least 16 cm inside the fumehood and ensure there is a 3 – 6 cm air gap around any large equipment in the hood
- ◆ Work with sash closed as far as practical to maintain effective capture of chemical fumes and to act as a safety shield.
- ◆ At the end of the experiment clean the fumehood and wait 5 minutes before switching off the fan.
- ◆ Remove experimental setup and keep the sash in a closed position.