

# MOUNT SINAI SCHOOL OF MEDICINE

## STANDARD OPERATING PROCEDURE FOR HANDLING CHEMICALS OF LOW TO MODERATE TOXICITY\*

### 1. General Rules

The following should be used for essentially all laboratory work with chemicals:

**(A) Accidents and Spills – Eye Contact:** Promptly flush eyes with water for a prolonged period (15 minutes) and seek medical attention in The Emergency Department. Report incident to your supervisor or Principal Investigator.

**Ingestion:** Encourage the victim to drink large amounts of water. Go to the Emergency Department immediately following water consumption.

**Skin Contact:** Promptly flush the affected area with water and remove any contaminated clothing. If symptoms develop or persist after washing, seek medical attention in the Emergency Department.

**Clean up:** Promptly clean up spills of dilute acids and bases, using appropriate protective apparel and equipment and proper disposal. Spills larger than 500mls, or of high acute or high chronic toxicity chemicals, notify the MSMC Safety Officer at Ext. 47233 and go to a safe location.

**(B) Avoidance of “Routine” Exposure:** Develop and encourage safe habits; avoid unnecessary exposure to chemicals by any route.

Do not smell or taste chemicals. Vent apparatus which may discharge toxic chemicals (vacuum pumps, distillation columns, etc.) into local exhaust devices, such as chemical hoods. Test glove boxes and inspect gloves for proper function before use.

Do not allow release of toxic substances in cold rooms and warm rooms, since these have contained recirculated atmospheres, with no dilution of vapors or gases.

**(C) Choice of Chemicals:** Use only those chemicals for which the quality of the available ventilation system is appropriate. Use chemical fume hoods instead of working on open bench, if the chemicals are noxious or have toxic properties.

\*LOW TOXICITY (HUMAN) =  $\geq 5\text{g/kg}$   
MODERATE TOXICITY (HUMAN) = 0.5 - 5g/kg  
FROM: CASSARET AND DOULL'S TOXICOLOGY; 3<sup>RD</sup> EDITION  
KLAASEN ET. AL.;

**(D) Eating, Smoking, Etc.:** No eating, drinking, smoking, gum chewing, or application of cosmetics is permitted in areas where laboratory chemicals are present; wash hands before conducting any of these activities.

Avoid storage, handling or consumption of food or beverages in storage areas, refrigerators, glassware or utensils which are also used for laboratory operations.

**(E) Equipment and Glassware:** Handle and store laboratory glassware with care to avoid damage; do not use damaged glassware. Use extra care with Dewar Flasks and other evacuated glass apparatus; shield or wrap them to contain chemicals and fragments should implosion occur. Use equipment only for its designed purpose.

**(F) Exiting:** Wash areas of exposed skin well before leaving the laboratory. Remove laboratory coats **before** leaving the laboratory.

**(G) Horseplay:** Avoid practical jokes or other behavior which might confuse, startle or distract another worker.

**(H) Mouth Suction:** Do not use mouth suction for pipetting or starting a siphon. Use a squeeze bulb, house vacuum or Bernoulli device for these functions.

**(I) Personal Apparel:** Confine long hair and loose clothing. Wear shoes at all times in the laboratory, do not wear sandals, open toe, or perforated shoes or sneakers, when handling hazardous materials.

**(J) Personal Housekeeping:** Keep your work area clean and uncluttered, with chemicals and equipment being properly labeled and stored; clean up the work area on completion of an operation or at the end of each day.

**(K) Personal Protection:** Assure that appropriate eye protection is worn by all persons, including visitors, where chemicals are stored or handled. Use face shields for work with strong corrosives.

Wear appropriate gloves when the potential for contact with toxic materials exists; inspect the gloves before each use, wash them before removal, and replace them when damaged, show signs of degradation, or periodically with continued use.

Use appropriate respiratory equipment when air contaminant concentrations are not sufficiently restricted by engineering controls. Consult Environmental Health & Safety on selection of respirators and their use **before** ordering or using such devices. A medical evaluation and fit-test are required before using a respirator.

Use any other protective and emergency apparel and equipment as appropriate. Know the location of emergency showers and eye wash stations, and maintain free access to these devices.

Avoid use of contact lenses in the laboratory unless absolutely necessary; if they are used, inform supervisor so special precautions can be taken.

Remove laboratory coats immediately on significant contamination. Launder or discard disposable coats periodically.

**(L) Planning:** Seek information and advice about hazards, plan appropriate protective procedures, and plan positioning of equipment before beginning any new operation. Obtain MSDSs and collect them in a central location within your laboratory. Develop a procedural outline covering use, storage and disposal of chemicals associated with the procedure. Train all personnel with respect to this planning

**(M) Unattended Operation:** Leave lights on, place an appropriate sign on the door, with a hazard warning and the danger associated, and provide for containment of toxic substances in the event of failure of a utility service (such as cooling water) to an unattended operation. If at all possible, avoid this practice.

**(N) Use of Chemical Fume Hood:** Use the hood for all operations which might result in release of toxic chemical gases, vapors or dust.

As a general rule of thumb, use a hood or other local ventilation device when working with any appreciably volatile substance with a PEL or TLV of less than 100 ppm. Consult the Material Safety Data Sheets for threshold limit values (TLV's) or permissible exposure levels (PEL's).

Confirm adequate hood performance before use; do not use a hood with flow less than 100 lf/m. Keep the hood closed at all times except when adjustments within the hood are being made; keep materials stored in hoods to a minimum and do not allow them to block vents or air flow. Call Engineering Services, Ext. 46201 (24 hr. number), if you doubt the performance of your fume hood, or to verify flow velocities before using.

**(O) Vigilance:** Be alert to unsafe conditions and see that they are corrected when detected. Watch overcrowding or overstorage of hazardous chemicals. Do not store incompatibles together. Do not store corrosives and poisons above waist height.

**(P) Waste Disposal:** All laboratory operations must include plans and training for waste disposal. Contact MSMC Safety Office for advice on chemical waste disposal before conducting an experiment.

Deposit chemical waste in appropriate containers, labeled with a hazardous waste label and follow all waste disposal procedures as outlined in your protocol.

Do not discharge to the sewer any chemicals, especially concentrated acids or bases; highly toxic, malodorous, or lachrymatory substances; or any substances which might interfere with the biological activity of waste water treatment plants, create fire or explosion hazards, cause structural damage or obstruct flow. Rinsing of stains from slides and washing containers with trace amounts of chemicals is acceptable.

**(Q) Working Alone:** Avoid working alone on a project. Do not work alone in a laboratory if the procedures being conducted are hazardous. Do not work late nights or weekends with toxic or hazardous chemicals, unless the procedure is a standard practice, and poses no exceptional risks to personnel.

2. **Prior to initiation** of experiments, all employee will consult the Material Safety Data Sheets (MSDS) for all reagents to be used in the protocol. Employees will familiarize themselves with hazards and will use the information contained on the MSDS to select the correct personal protective equipment (gloves, disposable suits, etc.), protective devices and safe storage and disposal practices. Additional assistance can be obtained through the Safety Office 47233, or from the MSSM Biosafety Officer, 41451.
3. All moderately toxic chemicals will be used under fume hoods in the laboratory, preferably in dosed, sealed systems i.e. screw-capped tubes or air-tight containers. Work on the open bench with these chemicals should be avoided completely.
4. All containers will be labeled with the full chemical name(s) of the reagents contained within on permanent labels, whenever storage of reagents is practiced. All hazards such as "Flammable," "Corrosive," "Poisons," etc., must be included on the label as well. Temporary containers holding material that will be used within one work-day does not require detailed labeling.
5. All waste containers will be properly and permanently marked with a Hazardous Waste Label, the proper date and with the full name of all chemicals contained within, and will be offered to the MSMC Safety Officer when disposal is desired. Preexisting labels on reused containers should be totally defaced or covered permanently. Once the container is full, disposal must occur within 3 days of capping as required by the US EPA.
6. All technical and research personnel will handle moderately toxic chemicals and chemicals used in routine procedures in accordance with information contained in Material Safety Data Sheets provided for these chemicals.
7. All employees will read and familiarize themselves with MSSM "**Chemical Hygiene Plan.**"

**Source:** *US Occupational Safety and Health Administration "Laboratory Standard" (29CFR 1910.1450) Appendix A, Section (E)(1) General Rules*