GENERAL HATTON LAB SAFETY RULES (66-325 AND 66-317)

HAZARDOUS MATERIALS

1) Labeling

- Do not remove the labels from incoming chemical containers.
- Properly identify containers of stock solutions (e.g., buffers labeled and marked with the word “BUFFER” and the type of buffer).
- Label ALL containers with the full chemical name, the date, and your name.
- If the full chemical name will not fit on the container, use an abbreviation, but then store the samples in a larger container that is labeled with the full chemical name and its abbreviation.
- Label synthesized, unnamed chemicals by their reactants and possible products (or by a useful generic description) and with their probable hazards.
- Label containers of non-hazardous substances (e.g., water) EXPLICITLY to avoid confusion.

2) Control

- Date containers of peroxide-forming chemicals upon receipt and dispose of them when the six-month shelf life is exceeded.
- Do not store chemicals on laboratory benches in excessive quantities.
- Provide secondary containment for ALL liquid chemicals in the hood, not just for liquid waste bottles.
- Dispose of expired and unused chemicals as hazardous waste.
- Segregate incompatible chemicals (including solids) by compatible storage groups.
- Do NOT store hazardous materials next to or above sinks.
- Do NOT store acids with bases or organics.
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- Do NOT store oxidizers with organics.
- Do NOT store organics under sinks.
- NEVER store solvents on the floor.

3) Use of Chemicals

- Keep all chemical containers closed, except when actively adding or removing materials (no funnels left in containers!).
- READ THE LABELS to properly identify any specific hazards associated with the chemicals being used.
- CHECK THE MSDS for special instructions on the use of the chemicals.
- Acetone should not go down the drain, but should be disposed of as hazardous waste.

4) Flammable/Combustible Liquids

- Make sure that the storage cabinets do not exceed maximum capacity of flammable liquids.
- Do not store flammable liquids (including flammable liquid wastes) outside of storage cabinets in excess of 10 gallons.
- Do not store flammables in combustible containers.
- Use ether and other highly-flammable liquids away from sources of heat and ignition (including Bunsen burners in hoods and gas water heaters).

CHEMICAL WASTE

5) Labeling

- All hazardous waste must be labeled with a red hazardous waste tag.
- Fill out the red hazardous waste tag as follows: write the waste's **full chemical name** (or a list of full names and percentages when waste mixtures are involved), check the box for the appropriate **hazardous properties**, and then write out **the building and room number**, the **name of the person** who generated the waste, and the **principle investigator's name** (in this case, Prof. Hatton).
- Do NOT date the red tags in the Satellite Accumulation Areas (the hoods) until the waste container is FULL.
- Label synthesized, unnamed chemical wastes by their reactants and possible products (or by a useful generic description) and with their probable hazards.

6) Storage

- Hazardous chemical waste containers and bottles MUST ALWAYS be placed in a secondary container that is large enough to contain the full contents of the waste bottle, if it leaks.
- These secondary containers must be located in a Satellite Accumulation Area (the hoods) and marked with a green Hazardous Waste Satellite Accumulation Area sticker.
- Store incompatible waste in SEPARATE secondary containers.
- Waste containers should be sturdy and should be routinely inspected for leaks.
- Waste containers should be compatible with the waste being added to the container (no hydrofluoric acid in glass containers, no corrosives in metal containers, etc.).
- Keep all waste containers closed, except when actively adding or removing materials (no funnels left in containers!).
- Dispose of solutions with heavy metals as hazardous waste.
- Acetone should be disposed of as a hazardous waste and should not go down the drain.
- Full waste containers should be moved out of the hoods and into the yellow solvent cabinet for waste pick-up.
- Arrange for all hazardous chemical waste to be picked up using the online form, NOT drain disposed or evaporated.
- Arrange for a waste pick-up as soon as the container is full.
- DISPOSE OF ALL CHEMICAL WASTE PROMPTLY AND PROPERLY.

7) Related Wastes

- Dispose of ALL clean or non-hazardous glassware (broken or whole) in the cardboard Broken Glass Disposal box.
- Dispose of ALL chemically contaminated glass, sample vials, syringes, needles, wire, razors, and other sharps in the white or gray plastic buckets.

PERSONAL HEALTH AND SAFETY

8) Food and Drink

- NO FOOD OR DRINK IS ALLOWED IN LAB.
- Food and drink should be stored only in a refrigerator or freezer labeled specifically for food (located in 66-321).

9) Hygiene

- Do not wear jewelry when working with chemicals.
- Do not wear contact lenses when working with volatile chemicals.
- Keep hands away from face while working in the laboratory (no cosmetic applications, taking pills, touching eyes, nose, and mouth, etc.).
- Wash hands after removing gloves and before leaving the lab.

HEALTH AND SAFETY EQUIPMENT

10) Safety Equipment and Procedures

- KNOW THE LOCATION OF THE SAFETY SHOWERS AND EYE WASHES.
- KNOW THE LOCATION OF THE FIRE EXTINGUISHERS AND THE FIRE BLANKET. Note that the fire extinguishers in the lab are carbon dioxide extinguishers and are only effective against Class B fires (involving burning liquids such as solvents) and Class C fires (electrical fires). The extinguishers in the lab are NOT very effective against Class A fires (burning paper or trash fires), and should NEVER be used against Class D fires (burning metal fires).
- KNOW THE LOCATION OF THE FIRST AID KIT AND THE SPILL KITS.
- Do NOT block access to safety equipment.
- Researchers who will be working with lasers MUST have a baseline eye exam performed by MIT Medical before beginning work.

11) Personal Protective Equipment (PPE)

- WEAR SAFETY GLASSES AT ALL TIMES WHILE WORKING IN THE LAB. Note that prescription glasses are NOT a substitute for safety glasses. MIT will pay for prescription safety glasses free of charge.
- WEAR LASER GLASSES AT ALL TIMES WHILE WORKING WITH THE LASERS.
- WEAR GLOVES AND A LAB COAT (and other PPE as appropriate) WHEN WORKING WITH CHEMICALS IN THE LAB.
- Select the correct PPE based on a hazard analysis or standard operating procedure:
  o Hearing protection o Face shields o Lab coats o Aprons o Gloves
  o PPE for radiological work o Safety glasses/goggles with side shields
- CHOOSE THE APPROPRIATE GLOVE FOR YOUR CHEMICALS! Note that latex and nitrile gloves are usually ineffective barriers against most hazardous chemicals. Both were developed for use with biologicals and are not intended to be used for protection from chemicals.

12) Laboratory Fume Hoods

- WORK IN THE HOOD WHENEVER POSSIBLE.
- Minimize storage within the hood.
- Keep the hood CLEAN to prevent clogging the exhaust.
- ELEVATE equipment at least 2 inches off the floor of the hood to maintain proper airflow.
- Perform all work AT LEAST 6 inches inside the hood.
- Lower the front sash as far as possible when using the hood.
- Keep sash lowered completely and the lights in the hood off when the hood is not in use.
- ALL liquid chemicals in the hoods must be kept in secondary containers (not just waste bottles) to prevent hazardous materials from entering the drains in the hoods.

13) Compressed Gas Cylinder Safety

- Store cylinders in well-protected, well-vented, and dry locations, away from highly combustible materials.
- Secure cylinders to a rigid structural component of the building
- Secure the cylinders with straps or chains at 2/3 of each cylinder's height (above the center of gravity of the cylinders).
- Use the appropriate regulator for the gas being used.
- Use protective caps while the cylinders are not in use or are being moved.
- NEVER move a gas cylinder with the regulator still attached to the cylinder.

14) Electrical Safety

- THOROUGHLY inspect all equipment wiring before use to make sure it is in good working order.
- Make sure that no equipment has frayed electrical cords.
- Do not chain extension cords and power strips together.
- No extension cords should be in permanent use in the lab. (This does not include surge protector strips, which are for permanent use.)
- DO NOT USE ALLIGATOR CLIPS TO CONNECT OIL BATH COILS TO THE HEATING/CONTROLLER ELEMENTS.

15) Needles/Syringe Safety

- Dispose of waste needles and syringes in a sharps bucket IMMEDIATELY after use.
- Clean reusable needles and syringes and place them back inside the sharps cabinet IMMEDIATELY after use.
- Whenever possible, do NOT recap needles. If you will be using a needle repeatedly over a short period of time, buy or make a container to store them in SHARP SIDE DOWN while they are not in use. (A large beaker with paper towels wadded in the bottom works fine.)
- DO NOT PERMANENTLY STORE NEEDLES AND SYRINGES IN THE HOODS!!
- DO NOT LEAVE EXPOSED NEEDLES LYING AROUND ON BENCHTOPS OR IN THE HOODS!!

16) Equipment Safety

- Equip vacuum lines with traps that are designed specifically to accumulate or filter the hazardous materials being evacuated.
- Adequately protect all moving machinery belts (e.g., vacuum pumps) by a rigid belt-guard or housing.
- Brace heavy equipment (computers, HPLCs).
- Operating instructions should be posted next to ALL equipment used in the laboratory and should include a contact person and their contact information.

17) Basic Safety

- Keep bench tops clean and organized to eliminate harmful exposures or unsafe conditions.
- Keep window ledges, walls, floors, and areas under sinks clean and orderly.
- Make sure that shelves used to store chemicals have lips or other restraints to prevent chemicals from falling off the shelves.
- Check that cabinets and bookshelves are secured to walls.
- Minimize overhead storage.

- The sprinklers in the ceiling achieve full water spray only at a point 18 inches below them, therefore do not stack anything closer than 18 inches below the sprinklers.
- Minimize storage of combustible materials (i.e. – cardboard boxes).
- DO NOT BLOCK ACCESS TO THE FUSE BOXES.
- KEEP ALL EXITS AND EXIT PATHWAYS CLEAR.