Department Resources – Instructional & Laboratory Services - Laboratories: Laboratory Operations

GOOD HOUSEKEEPING: WISHA regulations require work places to be kept free of potential hazards. Inspectors will cite areas with poor housekeeping.

The areas surrounding the following must be kept clear and free of obstruction:

- Building exits
- Emergency Showers
- Fire Extinguishers
- Stairways
- Eyewash Stations
- Electrical Controls
- Emergency Exits
- Sprinklers
- Telephone Stations

The floor must be kept clear at all times; any accumulation of bottles and apparatus on the floor is to be avoided. Bottles of chemicals on the floor are especially vulnerable to breakage.

BENCH TOPS: Keep laboratory bench tops clean and dry. If a corrosive reagent (i.e. concentrated nitric or sulfuric acid or caustic alkali) is spilled, wash off immediately with water. Neutralize acids and bases with a suitable reagent.

WRITING DESKS are not to be used as laboratory benches or for the storage of chemicals or apparatus.

FLOOR and floor covering must be protected from corrosive material and water.

- Remove immediately spills of small quantities of organic liquid (see Cleaning Up Chemical Spills).
- Remove immediately any small amount of acid or base that spills on the floor by using a suitable neutralizing reagent, such as sodium bicarbonate in the case of acids (see Cleaning Up Chemical Spills).

Spill clean-up kits are available from the stockroom (Bagley 36), and each lab should have one on hand for emergency clean-ups. For large spills, consult the Laboratory Safety Manual (black 3-ring binder—REQUIRED IN EVERY LAB).

WALLS AND DOORS: Do not use cellophane, masking, and other adhesive tapes on painted and varnished surfaces. Notices should not be posted on walls, doors, etc.

Exceptions to this rule must be approved by the building manager (BAG 109).

GUIDELINES FOR WASTE MANAGEMENT AND DISPOSAL

HAZARDOUS WASTE MANAGEMENT: The Laboratory Safety Manual contains detailed information regarding hazardous waste management. This manual is available in all working labs as well as in the reference station at the main desk in Bagley 109. For

more information, please contact the Safety Committee Chair or the Department Administrator.

PROCEDURES FOR WASTE PICKUP BY ENVIRONMENTAL HEALTH AND SAFETY

PACKAGE the chemical waste in a clean, non-leaking container. Original glass chemical bottles function best in this capacity. Please do not use flasks with ground glass, rubber, or cork stoppers.

LABEL the container with a Hazardous Waste label (available from the Stockroom) and fill in all information. The waste composition should be clearly identified (e.g., Potassium Dichromate Solution, approximately 5%). This information is essential for proper waste disposal. Do not use vague descriptions or structures.

Your research group is responsible for the following disposal costs:

- $83.00 per "unknown" item
- $250.00 for disposal of peroxide-forming solvents
- $2,500.00 per lecture cylinder without a label

Complete the Hazardous Waste Collection Request form, available from Environmental Health & Safety (3-9510), and mail it to them at Box 354400. The form is available at http://www.ehs.washington.edu/forms/Index.htm

All pickups should be made at the lab generating the waste. Do not bring chemical waste to the stockroom or loading dock for pickup.

For further information, visit http://www.ehs.washington.edu/waste/Index.htm

UNKNOWN CHEMICALS POLICY

LABELING: All containers of chemicals stored for more than a single 8-hour shift must be properly labeled and identified.

IDENTIFICATION: Faculty or supervisors are responsible for proper disposal of chemical waste.

- Identify chemical composition
- Label appropriately
- Dispose of properly or contact EH&S

ENFORCEMENT: All unidentified chemicals in the laboratory must be removed or labeled before a student may check out and receive his/her degree. Unidentified chemicals discovered during routine laboratory safety checks will be disposed. The current charge by an outside consultant is $100 per item.

When a laboratory is reassigned, the Department Administrator will ensure that all chemicals in the laboratory are properly labeled and disposed of. Contact Safety Committee Chair (3-8183) for more info.

RADIOACTIVE WASTE DISPOSAL: Consult UW Radiation Safety Manual, available in any work area in which radioactive materials are used or call 3-7262.

BIOLOGICAL WASTE DISPOSAL: Refer to UW Biohazard Safety Manual in Bagley 109.

SHARPS: Sharps include any medical or laboratory equipment that may cause punctures or cuts. Specifically, the definition encompasses all hypodermic needles, syringes, IV tubing with needles attached, lancets, scalpel blades, glass Pasteur pipettes, microtome blades, dental scalers, razor blades, and other sharp metal laboratory waste.

DISPOSAL: White plastic buckets with lids may be obtained from the Stockroom (Bagley 36) for disposal of sharps. When full:

- Place the lid on the container.
- Seal with the green LABORATORY GLASSWARE tape.
- Write the PI's name and laboratory room number on the bucket.
- Leave the bucket by the wastebasket for the custodian to dispose.

NEVER use the glass disposal boxes for the following:

1. sharps
2. biohazards that have not been autoclaved
3. liquid waste
4. chemically contaminated laboratory glassware
5. chemical containers that have not been rinsed

Consult the Management Guidelines found in the Laboratory Safety Manual for more information on the disposal of chemical wastes.

BIOHAZARDOUS SHARPS include any medical or laboratory equipment that may cause punctures or cuts and that has come in contact with a biohazard. Sharps containers are considered regulated waste even after they have been autoclaved.

DISPOSAL: Red plastic containers with lids may be obtained from the Stockroom (Bagley 36) for disposal of biohazardous sharps. The sealed containers should be labeled with the PI's name and room number. Call the Safety Committee Chair (3-8183) when you have a full container.

LABORATORY GLASS DISPOSAL: Laboratory glass and plastic ware must be placed in sturdy cardboard boxes for safe transport. The stockroom has cardboard boxes used specifically for this purpose. Boxes must be labeled with the room number and principal investigator's name and sealed with special "laboratory glass" tape. This tape is available from the stockroom (Bagley 36). Place the sealed box alongside regular waste for disposal.

RECYCLING: The Chemistry Department participates in the campus paper recycling program. See the receptionist in Bagley for information on ordering bag-it stands. Contact the Recycling Coordinator for more information (1-6543).

RECYCLE as Follows:

- WHITE BAG-IT: High Quality White Paper only
- BLUE BAG-IT: Newspaper (including inserts).

- GREEN BAG-IT: Mixed Paper (everything else).

Note: Staples are okay in all bag-its, but *remove all tape*!

DO NOT RECYCLE:

- carbon paper
- coffee cups
- lunch bags
- phone books (take to stockroom)
- material with food residue
- Styrofoam
- Hammermill paper ream covers
- packing peanuts (take to stockroom)
- plastic film material/transparencies

CARDBOARD RECYCLING: Cardboard must be recycled in the dumpster located by Rab's Room and Bagley 118. Empty and flatten all boxes before placing in the dumpster.

CONTAMINANTS: Any material other than corrugated cardboard is considered a contaminant and is not accepted by the vendor. Tablet backs, poster board, etc. may be placed in mixed paper (green) bag-its.

OTHER RECYCLING: Aluminum cans may be recycled in marked containers located in the first floor hallways. Glass bottles may be recycled in green "toters" located on the loading dock. Do not recycle laboratory glass (see Laboratory Glass Disposal).

USE OF UTILITIES AND RESEARCH SUPPLIES

GASES: Turn off piped utilities when not in use. A fast stream of gas is unnecessary to maintain a neutral atmosphere. A slow stream will suffice to maintain positive pressure. Liquid N2 cylinders are available when needed – see Research Stockroom attendant.

LIQUID GASES: Liquid gases (N2 and O2) are expensive. Dry ice/solvent mixtures can often be used. When using a warm dewar, liquid gasses can be conserved by slowly cooling the dewar before increasing gas flow.

HOKE VALVES: Hoke valves are recognized by their small size and small control wheels. These valves should be carefully hand-tightened.

FUME HOODS should be used when noxious gases are present. They are NOT to be used as permanent storage places, and apparatus set up in a hood should be removed as soon as the operation is completed.

NOTE: Hoods operate optimally with sash approximately 9" above sill. These heights also best contribute to room ventilation.

In the Chemistry Building, fume hood sashes should always be fully closed when not in use. Fume hood exhaust fans usually operate 24 hours a day. Fume hood air flows can be checked with a "Varometer", borrowed from the Research Stockroom (Bagley 36).

REFRIGERATORS AND FREEZERS: Each group is responsible for purchase and maintenance of refrigerators and freezers for cold storage. Units must be located within group space and labeled to indicate storage of flammable materials. Units must be cleaned regularly by the group responsible and all items must be labeled to indicate ownership, the name of the compound, nature of hazards involved, and the date.

GAS CYLINDER VALVES used with corrosive gases require special attention. After each use, REMOVE AND CLEAN the needle valve or other metallic device used as a junction between the cylinder valve and the apparatus. In many cases, this means disassemble, clean, and reassemble. A partial list of corrosive gases includes: hydrogen halides, halogens, boron halides, and nitrogen oxides (except N2O).

UTILITY WATER: Water should never be left running unless it is for a specific purpose. In an average year, flooding causes more damage in the Chemistry Department than anything else.

ANY FLOOD IS AN EMERGENCY. Contact the Receptionist (3-1610) immediately.

IF YOU DISCOVER A FLOOD, whether in your own laboratory or not, you have the prime responsibility to take action at once. **Any financial loss due to a flood which results from a research group's activity must be borne by the group.**

1. Find out where the water is coming from and shut it off.
2. Shut off power if lack of water can cause a dangerous situation.
3. Call custodial services at 5-1500 and report the flood. It takes about 15-20 minutes for them to load and deliver wetvacs and custodians to operate them. Water vacuums are available in the Research Stockroom (Bagley 36) and in the Machine Shop (Bagley 82). After hours, call University Police, 3-9331.
4. Call the main office and report the flood (3-1610).
5. Notify the Machine Shop (Bagley 82A, 3-1616) as soon as possible. They have plastic film available for covering equipment and desks in rooms below the flooded area and will assist where necessary.

RUNNING WATER: If you find it absolutely necessary to have water running while the laboratory is unattended, install a water flow device that can shut the system off in case of a failure. These units are commercially available and this small investment could be valuable insurance against your research group's financial loss because of an accident.

DO NOT place rags or other such material in sinks to avoid splattering, particularly where water aspirators are used. Use a small plastic bottle with the bottom removed.

FOOD FOR HUMAN CONSUMPTION cannot be prepared, cooked, or consumed in any building laboratory or shop. DO NOT store food in a refrigerator used for chemical storage.

ANIMAL CONTROL: Animals brought onto University property are subject to license and leash laws of the City of Seattle. According to WAC 478.124.080 live animals are not allowed in any University-operated buildings.

Exceptions are research animals maintained in University-controlled quarters, natural wildlife inhabiting University property, guide dogs accompanying sightless persons and, in certain specified situations, the University mascot. University Police will impound unleashed any stray

animals. Citations for violation of city ordinances regarding licensing and leashing of animals will be issued when violations occur outside buildings.

Persons who bring animals into University buildings will be asked to leave. If they refuse, call the University Police at 3-9331.

LABS AND OFFICES: must be clearly identified and posted with the following information:

1. Name of occupant(s)
2. Room function
3. Work Contact

MOVES WITHIN BUILDING: Requests for office moves must be submitted to the Department Administrator in Bagley 109F. Unauthorized relocations are not permitted.

When requesting new keys for a new location, you MUST inform the key issuer that you are moving.

CLEANING UP CHEMICAL SPILLS: Researchers working in labs MUST have training on proper disposal of ALL spilled liquids. Contact the Director of Instructional and Laboratory Services (3-8183) for more information. See also Health & Safety section.

MERCURY SPILLS: Laboratories and work areas that use mercury-containing equipment MUST have a mercury clean-up kit immediately accessible and laboratory personnel MUST be trained in mercury spill procedures. Contact the Director of Instructional and Laboratory Services (3-8183) for more information.

A broken thermometer or a quantity of mercury under 5ml is normally considered a small spill. Several powders, granules, and granule-impregnated sponges are commercially available and are appropriate for cleaning up spills of this size. The following mercury clean-up supplies are available in the Research Stockroom, Bagley 36: Mercury Absorbent Powder (20-222).

A. CLEANING UP MERCURY SPILLS ON A COUNTER TOP OR NONPOROUS FLOOR:

1. Mark or cordon off the area of the spill to prevent inadvertent spread of the mercury
2. Wear gloves and goggles during clean-up operations
3. Moisten a mercury-absorbent sponge with water and wipe down the area of the spill. Some of the mercury will be absorbed into the sponge and some will be amalgamated on the sponge surface. Sponge capacity can be increased by rubbing mercury absorbent powder into the surface of the sponge.
4. Slowly wipe or sweep the sponge over all cracks and hard-to-reach areas to pick up as much mercury as possible. If you are unable to remove all of the mercury, dust the area with mercury absorbent powder. The resulting amalgam will not emit mercury vapors.
5. Place any broken glass or mercury-contaminated materials such as gloves in a screw-capped plastic container.
6. Use additional sponges as necessary until the entire area has been decontaminated. Discard used sponges into a screw-capped plastic container or back into their zip-locked bag. Label the bottle or bag with a "hazardous waste"

label and place in a fume hood or other well-ventilated location, pending pick-up by EH&S personnel. Notify EH&S by submitting a hazardous waste collection request form.

B. CLEANING UP MERCURY SPILLS ON POROUS FLOORING OR CARPET:

The preferred method for cleaning up mercury spilled on porous flooring or carpeting is a mercury vacuum. Vacuum users should be instructed in proper use and handling. The vacuum can be obtained from BAG 293.

C. CLEANING UP MERCURY SPILLS IN OVENS, INCUBATORS, HOT WATER BATHS, OR OTHER ELEVATED TEMPERATURE AREAS:

When the temperature is elevated, exposure to mercury vapor is more likely. A thorough clean-up is mandatory:

1. Close the oven or incubator door
2. Turn the equipment off
3. Open the windows
4. Leave the room until the unit has cooled
5. If the unit is an oven call EH&S (3-0467) for room monitoring. After the unit has cooled, use the clean-up method described for countertops, taking care to ensure a thorough clean-up.
6. If disassembly of the unit is required, contact the University Scientific Instruments Division at 3-5580.

ORGANIC LIQUID SPILLS: Organic liquids spilled on the floor constitute a fire hazard as well as destroy flooring. An absorbent material is required in every laboratory. Additional supplies are stocked in the Research Stockroom (Bagley 36) and the Undergraduate Stockroom (Bagley 271).

1. Place the material on the spill
2. Wait several minutes
3. Pick up
4. Allowed to evaporate in a fume hood
5. Discard in a plastic bag.

ACID SPILLS: Acid spills can be neutralized with bulk sodium bicarbonate, also available in both department stockrooms. Any solid residue should be bagged in plastic and disposed of through EH&S.

After bagging and disposal, call Custodial Services (5-1500) to mop the floor.