

Laboratory Chemical Hygiene Plan

Building and Room Numbers: Engineering Research Building 1125, 1128, and 1202
Department: Materials Science and Engineering
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Date of Most Recent Review (at least annually): August 22, 2008

I. Standard Operating Procedures to Protect Safety and Health

This laboratory follows the procedures in Chapter 4, “Chemical Safety Procedures” of the *Laboratory Safety Guide* when working with hazardous chemicals.

In addition to the procedures described in the *Laboratory Safety Guide*, the following specific practices are required:

- 1) Use of laboratory equipment requires prior approval and training. Personnel using the equipment must be listed on the “Training Documentation” page posted in 1202 Engineering Research Building.
- 2) Using the rotating anode x-ray diffractometer in room 1128 requires separate specific training. See http://xray.engr.wisc.edu/resources/xray_generator_guidelines_8-08.pdf.
- 3) Appropriate protective equipment must be worn when working with chemical or physical hazards, including when hand tools are in use.
- 4) Always wash your hands after using laboratory equipment or chemicals and before eating or using the toilet. If your chemicals require gloves, do not use gloves to touch anything that might be touched with ungloved hands.
- 5) Personnel working in the laboratory are required to use long pants and closed to footwear when working with heavy equipment or with chemicals.
- 6) Keep food and beverages out of the laboratory.
- 7) This document must be posted with the MSDS binder. It is also available online at http://xray.engr.wisc.edu/resources/chemical_hygiene_plan_8-08.pdf.

This document is based on the template developed by the University of Wisconsin Environment, Health and Safety Department. available at <http://www2.fpm.wisc.edu/chemsafety/forms.htm>.

II. Criteria to Implement Exposure Control Measures

Use of any hazardous chemical (refer to section 4.6 and Appendix D of the *Laboratory Safety Guide* and to MSDS if you are not sure of the hazard level of the chemical you are using) requires gloves and chemical goggles or face shields in addition to the normal required personal protective equipment. Whenever possible, hazardous chemicals should only be used inside the fume hood.

A list of all Hazardous Chemicals in this laboratory is included in the MSDS binder. The introduction of any additional chemical must follow the procedures found in section V of this Chemical Hygiene Plan.

Particularly hazardous substances (see Section 4.6 and Appendix D of the *Laboratory Safety Guide*) are capable of causing serious and potentially permanent injuries through:

- ♦ short-term exposure including accidents (acute).
- ♦ long-term exposure if used under normal laboratory conditions (chronic).

Additional safety precautions are used with particularly hazardous substances. The precautions should be appropriate to the hazards. Precautions to consider include:

- ✓ Working in a fume hood (e.g., volatile liquids, fine powders).
- ✓ Using extra eye protection (e.g., caustic liquids).
- ✓ Using specially selected gloves and/or double gloving to prevent skin absorption (see Chemical Resistance Glove Chart in Chapter 4).
- ✓ Chilling volatile liquids.

Appendix D discusses particularly hazardous substances in more detail and presents a process to insure persons working with such substances are aware of both the hazards and the specific precautions for the intended usage.

Two copies of all MSDS for chemicals used in this lab will be collected. One copy will be placed in the MSDS binder located in the room in which the chemicals are stored. For chemicals stored in Room 1125 Engineering Research Building, the MSDS binder is located next to the fume hood. For chemicals stored in Room 1202 Engineering Research Building, the MSDS binder is located to the right of the sink. The second copy of the MSDS will be filed with the Building Manager. The Building Manager and the UW-Madison safety department can assist personnel in finding MSDS if necessary.

III. Fume Hoods and Protective Equipment

The Safety Department inspects laboratory fume hoods annually and places a sticker (see Section 4.5) on the hood that identifies maximum safe sash height and any other performance restrictions. If the date on the fume hood sticker is over one year old, call the Safety Department to have the hood reevaluated. Additional measures that help assure proper fume hood performance include (see also Annex 4-2):

- ✓ Close the sash as much as possible, even when working in the hood. Use a horizontal sliding sash or blast shield when working with equipment that is likely to shatter or splash.
- ✓ Use a tissue to verify that air is flowing into the hood.
- ✓ Maintain airflow pathways front to back. Elevate large items so that air can flow under them. Align items from front to back instead of across the back of the hood.
- ✓ Keep all work more than 15 cm (6 inches) behind the sash opening.
- ✓ Keep heaters more than 30 cm (12 inches) behind the sash opening.

- ✓ Have spill control materials available (i.e., secondary containment [trays], absorbents, spill kits) and plans posted.
- ✓ Keep hood clutter free, do not use it as a storage area. Store chemicals and other material in storage cabinets so they will not become involved in a hood accident.
- ✓ Keep adjustable baffles at the center position. Do not attempt to use another baffle position unless you have verified that it is better.
- ✓ Use personal protective gear (i.e., goggles, apron, shield, gloves) as appropriate for the type of chemical work.
- ✓ Use good personal hygiene. A fume hood cannot protect against skin absorption or accidental ingestion of chemicals.
- ✓ Understand and obey labels and placards.

Contact the principal investigator and Building Manager before using protective equipment not described in Chapter 4.

IV. Information and Training

This laboratory provides personnel with information and training to ensure that they are aware of the hazards of chemicals present in their work area. The training is given at the time of the person's initial assignment to a work area where hazardous chemicals are present.

Safety training is part of the orientation of all new laboratory personnel. This training includes the training procedure described in Appendix G of the *Laboratory Safety Guide*. The requirements of this training are:

- 1) Read and understand the required sections of the *Laboratory Safety Guide*, including all relevant sections of chapters 2, 4, 5, and 7 and appendices A, B, D, F, and I.
- 2) Review this *Chemical Hygiene Plan* in detail.
- 3) Review all MSDS for chemicals to be used during activities in this laboratory.
- 4) Attend the ***Working Safely with Chemicals*** training class conducted by the Safety Department. This course is conducted weekly. Times and locations are available on the Safety Department web site <http://www2.fpm.wisc.edu/safety/Radiation/schedu.html>.

When these training requirements are completed, each worker must enter his or her name in the “Training Documentation” form posted in Room 1202 Engineering Research Building before beginning work in the laboratory.

Each laboratory worker must be familiar with the contents of this Chemical Hygiene Plan and know:

- ✓ Where the plan is available.
- ✓ The location of Material Safety Data Sheets (MSDS) and other hazard information in the laboratory. The Safety Department will send any MSDS that needed to complete your reference set. Alternatively, links to MSDS sites are available at the Safety Department's web site, <http://www2.fpm.wisc.edu/chemsafety/links.htm>
- ✓ How to detect the presence or accidental release of a hazardous chemical
- ✓ The hazards of chemicals in the work area and how to protect against them
- ✓ How to manage and dispose of waste or unwanted chemicals

V. Operations, Procedures or Activities that Require Prior Approval

This laboratory considers its operations, activities, and procedures to determine whether prior approval would be required. New reactions or experiments require approval from the principal investigator.

VI. Medical Consultation and Examination

A laboratory worker must have an opportunity to receive a medical examination or consultation without loss of pay and at no cost to the worker when:

- ♦ The individual develops signs or symptoms associated with a hazardous chemical to which they may have been exposed in the laboratory.
- ♦ Measurements show that an OSHA/Wis. Dept. of Commerce action level or Permissible Exposure Limit is routinely exceeded.
- ♦ There has been a spill, leak, explosion or other occurrence in the work area resulting in the likelihood of a hazardous exposure.

University employees may receive medical care through their State Group Health Insurance health care plan. Students may receive medical care from the University Health Service. For the physician to provide professional care, provide the following information:

- ♦ The identity of the hazardous chemical(s) to which the employee may have been exposed.
- ♦ A description of the conditions under which the exposure occurred including quantitative exposure data, if available.
- ♦ A description of the signs and symptoms of exposure that the employee is experiencing, if any.

Before the PI or the University can act on an examination, they will need a written opinion from the examining physician that includes the following:

- ♦ Any recommendation for further medical follow-up.
- ♦ The results of the medical examination and any associated tests.
- ♦ Any medical condition revealed in the course of the examination which may increase the employee's risk if a chemical exposure occurs in the workplace.
- ♦ A statement that the physician has informed the employee of the results of the consultation or examination and any medical condition that may require further medical attention.
- ♦ The written opinion shall not reveal other specific findings of diagnoses that are unrelated to occupational exposure.

For more information or guidance, contact the Safety Department Occupational Health Manager (26)3-2177.

VII. Minimizing Waste and Preventing Pollution

Follow the recommendations of Chapter 6 of the *Laboratory Safety Guide* to the extent feasible while minimizing interference with primary laboratory operations.

VIII. Chemical Waste Management

Follow the procedures of Chapter 7 and Appendix A of the *Laboratory Safety Guide* to manage chemical waste. For questions or more information about specific waste streams, call the Safety Department at 265-5518.

The Safety Department will recycle, neutralize or dispose of chemicals by methods that have been approved by Federal and State agencies, that are safe for human health and the environment and that comply with local, state and federal regulations.