

## Section IV: Standard Operating Procedures

### C. Standard Operating Procedures (SOPs) for Hazardous and Particularly Hazardous Chemicals

A form titled "**Standard Operating Procedures for Hazardous and Particularly Hazardous Chemicals**," has been provided at the end of this section. The form contains "fill-in-the-blank" areas which correspond to the specific items listed below.

The following elements must be included in your SOPs:

1. Description of Experiment/Identification of Procedure: An identification or description of the experiment or research proposal in which an employee may be exposed to a hazardous chemical in the laboratory (e.g., "dissection of rat", or "synthesis of polypeptide"). Note that the description applies to both teaching and research laboratory activities. Typically the experiment or research will be associated with one or more laboratory *procedures*. Often these laboratory procedures are written, and may be described in technical journals or textbooks. The intent is communication to the laboratory employee precisely which part or parts of laboratory research or teaching activity in which there may be exposure to a hazardous chemical substance.
2. Identification of Chemical Hazard: An identification of each hazardous chemical substance, as well as each *physical hazard* and/or each *toxicity hazard* which may be encountered due to exposure to that hazardous chemical substance. For example, a procedure calls for use of a distillation process in the purification of benzene. In the distillation process, explosion or fire may be a hazardous condition which may be encountered. Explosion or fire is a *physical hazard* which may be associated with the hazardous chemical. Also, the solvent, itself, may have a toxic principle (a *toxicity hazard*) which needs to be considered in addition to the possible fire or explosion hazard.
3. Identity of Trainer/Resource Person: An identification of the person or organization responsible for health and safety training, specifically for the procedure or process in which a physical or toxicity hazard is present. This person or organization should also be a resource for any health and safety related question which may arise about the hazards associated with a particular chemical used in a particular procedure or process. Typically, this resource/training person is the Principal Investigator, the Instructor, or the Laboratory Supervisor for the particular laboratory in

which the employee is working.

4. Location of Health & Safety Information: Note that labeling requirements, MSDS information, the location of emergency equipment, and chemical spill management and/or evacuation procedures are provided in other parts of this chemical hygiene plan. For purposes of simplicity and the minimization of redundancy, the MSDS may be attached to the SOP. If an MSDS is *not* available, or if there are special requirements related to spills and/or emergencies, they must be explicitly presented to the employee in the SOP.
5. Protective Equipment: Note that ventilation controls (like a fume hood, for example), personal protective equipment (i.e., goggles, gloves, respirator), special handling procedures and storage requirements are typically provided in the MSDS for a specific hazardous chemical. However, the MSDS may not adequately communicate protective equipment information. For instance, the MSDS may state "wear impervious rubber gloves." Since there are many kinds of "rubber" gloves, some of which are impervious and some of which are not, supplemental information must be communicated through the use of another source, and the location of this source must be identified (a person, written document, publication, etc.). If information provided by the MSDS is insufficient, more specific information must be provided in a written form in the SOP. As an example, the MSDS for acetaldehyde indicates the use of "rubber gloves," but you determine from **Appendix F** that neoprene gloves are good but latex gloves are poor for handling acetaldehyde, then you must specify in the SOP that neoprene gloves must be used. Note that if an employee is required to wear a respirator, the employee must contact EH&S and comply with the respiratory protection program. It should also be understood that certain aspects of personal protective equipment are addressed in regulations outside the lab safety rule (see **Section E**. "Personal Protective Equipment.")
6. Waste Disposal: Typically MSDSs do not provide adequate or appropriate information about disposal of waste. Clear directions for waste management are presented in **Section II.K**. and **Appendices E, H, I and J** of this manual. It is important that specific information be provided to employees in laboratories about the proper management of chemical, biological and radioactive wastes, and these should be placed in the SOP. If you have questions about classification of waste items, please contact EH&S at 335-3041 and discuss your concern with a chemical waste management specialist.
  - a. Certain chemical wastes are regulated as "dangerous wastes" by the Environmental Protection Agency (EPA) and the Washington Department of Ecology (WDOE). Consult with Environmental Health & Safety if a question arises concerning whether a chemical waste is regulated as "dangerous" or not. Generally, EPA/WDOE considers laboratories, or in some cases a group or suite of laboratories, to be "satellite accumulation areas" (SAAs) for dangerous wastes. A separate container must be used for each type of waste generated. SAAs are permitted to accumulate, over an indefinite period of time,

up to 55 gallons per each type of "dangerous waste" and up to a quart of "extremely hazardous waste." At the point that these volume limits are reached the waste must be transferred from the SAA (laboratory) to a 90-day accumulation area (e.g. a department's central chemical waste storage area within 72 hours.

It is of great importance that hazardous chemical wastes not be disposed of in the regular solid waste collection system. Under some circumstances, chemical wastes mixed or thrown away with regular solid wastes in a dumpster or trash can cause all of the waste in the dumpster to become "dangerous waste", resulting in large disposal costs. Pls or departments are liable for costs of improper disposal of hazardous chemical waste. See **Appendix E** for procedures for disposal of hazardous chemical wastes. Contact Environmental Health & Safety (335-3041) with questions about hazardous chemical wastes.

- b. Waste materials which are radioactive are classified as "high-level" or "low level" wastes. All radioactive wastes are managed by the WSU Radiation Safety Office. Some wastes may be a mixture of radioactive material and hazardous chemical material. "High-level" wastes, even if in a mixture, are regulated and managed under WSU's radioactive license issued by the Washington Department of Health (WDOH). "Low-level" wastes mixed with hazardous chemicals are regulated under both radioactive waste and hazardous waste regulations. See **Appendix J** for procedures for disposal of radioactive wastes. Contact the Radiation Safety Office (335-7383) with questions about radioactive wastes.
- c. Waste materials are considered to be "pathological" or "biohazardous" if contaminated, or possibly contaminated, by infectious agents. Dead animals, animal parts, blood and blood products, syringes and sharps, animal waste products, and other similar kinds of materials may be considered to be "pathological" or "biohazardous" wastes. See **Appendices H and I** for procedures for disposal of pathological/ biohazardous wastes. Contact Environmental Health & Safety (335-3041) with questions about "pathological" or "biohazardous" wastes.
- d. Uncontaminated glass waste must be disposed of in such a manner that laboratory personnel, custodians, and sanitation workers are not exposed to cuts, abrasions, or back injuries. See the new Safety Policies and Procedures Manual section entitled "Disposal of Glass Waste, **SPPM S80.14.**"
- e. For handling or disposal of materials which may contain blood or human secretions, refer to the WSU Bloodborne Pathogen Exposure Control Plan.
- f. Waste materials which are considered to be non-hazardous, or which do not come under regulatory definition as "hazardous" are normally disposed of through the regular solid waste collection system. See

Identifying Chemical Waste, **SPPM S70.41** for information about comingling of solid and hazardous wastes

- g. Note that waste from animals may contain toxic, radioactive and/or biohazardous substances. If special management of this waste is required in order to protect human health and the environment, specific information should be provided in the waste disposal section of the SOP.

7. **If the chemical is a particularly hazardous chemical see section IV.A. WAC 296-62-40009(h)** specifies additional regulatory requirements for employee protection if the hazardous chemical is (1) of high acute toxicity, (2) a reproductive toxin, or (3) is a select carcinogen. These requirements are:

- a. Establishment of a "designated area". A designated area is a space whose boundaries are identified for specific or exclusive use of a particularly hazardous chemical. A designated area can be a fixed piece of equipment such as a fume hood or it may be a small room or enclosure. The designated area must be labeled, and its labeling must serve two purposes:
  - 1. The designated area must have warning signs which will prohibit access by persons who do not have special information and training which would allow safe handling of the chemical. It is highly recommended that the warning sign contain the name(s) of persons authorized to use the particularly hazardous chemical in question, so that the(se) person(s) may be contacted in the event of an emergency or if questions arise.
  - 2. The boundaries of the designated area must be clearly demarcated (i.e., with colored tape, or by the door to a specific small room or enclosure).
- b. Use of containment devices such as fume hoods or glove boxes. (List on Standard Operating Procedures for Hazardous and Particularly Hazardous Chemicals Form, No. 5, Protective Equipment.)
- c. Procedures for safe removal of contaminated waste. (List on Standard Operating Procedures for Hazardous and Particularly Hazardous Chemicals Form, No. 6, Waste Disposal Procedures.)

Decontamination procedures. (List on Standard Operating Procedures for Hazardous and Particularly Hazardous Chemicals Form, No. 8, Decontamination Procedures.) Decontamination procedures provide specific directions for decontamination of surfaces of benches, walls, ceilings, surfaces of fixed equipment, and surfaces of portable equipment which may be contaminated by the particularly hazardous substance. They provide information about the use of special protective equipment, such as gloves, face shields, goggles, body and foot coverings which may be necessary to protect the person(s) performing decontamination. Further, specific

directions are given about handling and disposal of contaminated waste.

- d. Special Storage and Handling Procedures. (List on Standard Operating Procedures for Hazardous and Particularly Hazardous Chemicals Form, No. 9, Special Storage and Handling Procedures.) This section is not required; however, it is a section to provide additional information if needed.

A form titled "**Standard Operating Procedures for Hazardous and Particularly Hazardous Chemicals,**" contains "fill-in-the-blank" areas that correspond to the specific items listed above.

For items 1 through 6: Use the directions provided in **Section IV.C**. For items 7 through 9, see **Section IV.C, 7, a-e**, above.