

Chemical Hygiene Plan
Chemistry Department
Loyola University Chicago
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Appendices: Online References

1. Standard from the Federal Register, Occupational Exposures to Hazardous Chemicals in Laboratories. 1910.1450, found online at http://www.osha.org/pdf/rules/division_2/div2z-1450-occxptochems.pdf
2. Appendix A from the Standard, National Research Council Recommendations Concerning Hygiene In Laboratories (Non-mandatory) found online at http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=standards&p_id=10107
3. Glossary of Terms found online at <http://www.grainger.com/images/GlossaryofSafetyTermsPDF.pdf>
4. OSHA, Code of Federal Regulations, 1910.1000, *List of Toxic and Hazardous Substances*, found online at <http://www.doli.state.mn.us/OSHA/PDF/pels.pdf>.
5. For the purchase of individual volumes detailing recommended Threshold Limit Values of individual substances, see American Conference of Governmental Industrial Hygienists (ACGIH), *Threshold Limit Values/or Chemical Substances in the Work Environment*", available online at <http://www.acgih.org/store/BrowseProducts.cfm?type=cat&id=16>

6. National Toxicology Program (NTP), *Annual Report on Carcinogens* found online at <http://ntp.niehs.nih.gov/?objectid=72016262-BDB7-CEBA-FA60E922B18C2540>
7. World Health Organization, International Association of Research on Cancer (IARC), Monographs available online at <http://www.iarc.fr/>
8. Environmental Protection Agency Introduction to Hazardous Waste Identification, available online at <http://www.epa.gov/osw/inforesources/pubs/hotline/training/hwid05.pdf>.
9. a) Occupational Health Program Safety Training Series – Safe Handling and Use of Liquid Nitrogen. available online at <https://fpm-www3.fpm.wisc.edu/safety/occupationalhealth/LinkClick.aspx?link=LiquidNitrogenSafetyTraining.pdf&tabid=63&mid=442>, b) Cylinders: Safe Storage, Handling, and Use <http://www.aws.org/technical/facts/FACT-30.pdf>

I. INTRODUCTION

The primary goal of this regulation, which applies to academic basic science and related noncommercial laboratories, is to ensure that workers are informed of the hazards of the chemicals that are used during the performance of their work tasks. Furthermore, the laboratory must provide the worker with education, training, and information on permissible exposure levels, signs and symptoms of exposures, the location and availability of Material Safety Data Sheets (MSDS), as well as defined prudent work practices, and use of personal protective equipment (PPE) and engineering controls required to prevent exposures to hazardous substances.

Additionally, employees must be apprised of any physical hazards contained in the laboratory as well as emergency procedures, access to medical consultation, and general operating procedures indicative of prudent laboratory practice.

The Loyola Chemistry's Chemical Hygiene Plan is a document that details the above topics and is accessible to all employees, students and staff along with other technical references pertaining to principles of laboratory safety. The Hygiene Plan draws upon recommendations from the National Research Council (NRC), as documented in *Prudent Practices for Handling Hazardous Chemicals in Laboratories* (1981 NRC Publication) and in *NRC's Recommendations Concerning Chemical Hygiene in Laboratories (Non-mandatory)* available online at http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=standards&p_id=10107.. These recommendations include widely accepted safe work principals and were made by members of the laboratory community. In addition to chemical hazards, this publication offers guidelines for control of other physical hazards common to laboratories.

Every faculty member, laboratory teaching assistant, employee and student laboratory researcher working directly with lab chemicals or who is responsible for laboratory students or researchers must read and enforce the contents of this document.

Responsibility for controlling hazards and practicing safe science is critical to the success of all laboratory experimentation and data generation and therefore lies with laboratory management since they assign and direct these activities. Employees and students carrying out these tasks must also comply and may be subject to disciplinary action if these requirements are flouted.

II. Material Safety Data Sheets (MSDS) and Chemical Inventories

Material Safety Data Sheets (MSDS's) are the primary vehicle by which the potential hazards of a substance are communicated. MSDS's are provided by the manufacturer and are legally mandated to contain current established data reflecting the:

*Physical and chemical characteristics (pH, vapor pressure, flash point, reactivity, chemical incompatibilities, etc.) and associated hazards to biological systems (mutagenicity, toxicity, etc.)

*Chemical Abstract Service Registry number (CAS #)

Permissible Exposure Limits and recommended engineering controls (i.e. fume hoods, biological safety cabinets, PPE, and suggested safe work practices all designed to eliminate exposures via inhalation, absorption, ingestion and injection).

Recognizable appearances and odors of reagents and first aid measures in case of exposure.

Accidental release, spill control and disposal information.

Every Loyola Chemistry lab section and research lab using chemicals must maintain a list of chemicals used and/or stored in the lab (chemical inventory) and a repository of MSDS's (physical or online) to reflect the current chemical inventory. If hard copies are used, MSDS's must be filed alphabetically in a dedicated repository (e.g. notebook or file drawer), which must be accessible to all in the laboratory.

MSDS's are normally sent by chemical manufacturers on the first shipment. Any first time shipments of reagents that contain current data sheets must be retained by the receiving laboratory and filed in the lab repository of MSDS's. Missing or additional copies can be retrieved by contacting the manufacturer directly and giving the catalogue or CAS # to the company's technical division.

Training on how to read and interpret MSDS's will be provided for each teaching assistant and laboratory researcher working with lab chemicals in the annual departmental safety training, or through online safety training, or by the faculty member directly responsible for the individual lab.

III. HAZARDOUS CHEMICALS DEFINED

In a broad sense, a hazardous material is any substance or mixture of substances having properties capable of producing adverse effects on the health or safety of a human being. In a practical sense, however, this definition is of little use without specific criteria for how to identify chemicals causing adverse effects. In 1971, the Occupational Safety and Health Administration (OSHA) developed some precise criteria in its regulations affecting employers (see Hazardous Materials defined in glossary of terms). Once again, however, these criteria are difficult to apply without the appropriate information. Therefore, for the purposes of this Chemical Hygiene Plan, a substance is defined as hazardous if it can be found on one or more of the lists (enumerated below) contained in Appendices 4 -8. These lists include chemicals that fall under 6 general categories of hazards: poisons (toxins), corrosives, flammables, explosives, carcinogens, and radioactive materials and that meet the criteria set forth by the original OSHA standards.

Mixtures of chemicals containing one or more hazardous chemical are only considered hazardous if they contain a final concentration of 1% or greater of the hazardous chemical, or in the case of carcinogenic substances, 0.1 % or greater. Furthermore, common, commercially-available products,

such as glues, epoxies, paints, thinners and cleaning products are exempted from these lists. Nevertheless, workers who use these products in their work should be careful to follow the manufacturer's recommendations for safe use.

Loyola University Chicago will provide employees the opportunity to receive medical attention, without cost to the employee, under the following circumstances:

- 1) Whenever an employee develops signs or symptoms associated with a hazardous chemical to which the employee may have been exposed in the laboratory
- 2) Where exposure monitoring reveals an exposure level routinely above the action level for an OSHA regulated substance for which there are exposure monitoring and medical surveillance requirements.
- 3) Whenever an event takes place in the work area such as a spill, leak, explosion or other occurrence resulting in the likelihood of a hazardous exposure.

Online Reference Appendix (cont.): Lists of Hazardous Substances

4. OSHA, Code of Federal Regulations, 1910.1000, *List of Toxic and Hazardous Substances*, found online at <http://www.doli.state.mn.us/OSHA/PDF/pels.pdf>
5. For the purchase of individual volumes detailing recommended Threshold Limit Values of individual substances, see American Conference of Governmental Industrial Hygienists (ACGIH), *Threshold Limit Values/or Chemical Substances in the Work Environment*", available online at <http://www.acgih.org/store/BrowseProducts.cfm?type=cat&id=16>
6. National Toxicology Program (NTP), *Annual Report on Carcinogens* found online at <http://ntp.niehs.nih.gov/?objectid=72016262-BDB7-CEBA-FA60E922B18C2540>
7. World Health Organization, International Association of Research on Cancer (IARC), Monographs available online at <http://www.iarc.fr/>
8. Environmental Protection Agency Introduction to Hazardous Waste Identification, available online at <http://www.epa.gov/osw/inforesources/pubs/hotline/training/hwid05.pdf>

Of the above lists, those included as appendix Items 4 and 5 will be most useful to lab workers for a general determination of which chemicals in their lab are hazardous. Appendices Items 6 and 7 will help to identify only those chemicals that are carcinogenic, whereas Appendix Item 8 will help to determine which chemicals are considered hazardous wastes by the Environmental Protection Agency.

In addition to the above lists, all active laboratory researchers are urged to check the current MSDS. Please be aware, however, that substances categorized as hazardous by the MSDS might not pose a

hazard to humans in the small volume and concentrations used in a typical basic science lab. For reasons of product liability, the manufacturer may have included bacterial and animal model studies conducted with volumes and concentrations greater than those used in science labs to establish some level of hazard on the MSDS.

IV. Carcinogens, Reproductive Toxins and Acutely Toxic Substances

The Loyola Department of Chemistry's Chemical Hygiene Plan also requires that faculty heads of labs provide additional training on precautionary measures to follow when carcinogens, reproductive toxins or acutely toxic substances are used. The designation of a reagent as a carcinogen or highly toxic substance will be given in the MSDS and/or the label provided by the manufacturer.

Reproductive toxins are defined as those substances (a) having lethal effects on fertilized eggs, developing embryos or fetuses, (b) producing teratogenic effects in fetuses or (c) causing infertility in males and females. Hydrogen sulfide and cyanide as well as salts of these compounds are examples of substances that are acutely toxic. Due to the extreme hazardous nature of these chemicals and the potential damage to target organs and possible fatality as a result of a single acute exposure or one of short duration, prior education and careful discussion of performing the protocol is vital. This training must take place prior to work with these substances.

Select carcinogens, reproductive toxins or substances with a high degree of acute toxicity require prior approval from Bill Curtain before use.

The following websites may be helpful in determining if the use of a chemical requires prior approval. Lists are updated periodically and you should be sure to access the most current list. Other sources of information, such as MSDS must be consulted.

<http://www.osha.gov/dsg/hazcom/ghd053107.html>

<http://www.epa.gov/tri/trichemicals/index.htm>

<http://toxipedia.org/display/toxipedia/Hazard+Rankings>

Of vital importance is the need to:

1. Establish a "designated work area" when handling these substances, i.e. a chemical fume hood or portion of a work area that has temporary or permanent signage (in English) apprising anyone entering the lab premises that this is an area where substances of highly hazardous nature are being used. When the task using these substances is complete, and the area decontaminated if necessary, then the signage may be removed.
2. When not in use these agents shall be stored in a secure cabinet or sealed container.
3. If the manufacturer's label has become defaced or illegible a new one must be affixed containing

the identity, potential carcinogenicity, and or highly toxic nature of the substance.

4. Avoid breathing vapors, gases or particulate.
5. Avoid contact with eyes, skin and clothing by donning the proper chemical resistant glove, safety glasses, goggles and a buttoned lab coat.
6. Conduct all manipulations, weighing, mixing, pouring, pipetting, and boiling in a ventilated enclosure such as chemical fume hood.
7. Disposal of waste and contaminated items, accidental spill response and cleanup are referenced in this Chemical Hygiene Plan.

V. Loyola Department of Chemistry Laboratories: Standard Operating Procedures for Safe Work Practices and Maintenance.

Attention to good housekeeping impacts the general safety of the lab and supports the University's commitment to fire prevention. A cluttered work space increases the risk of slips, trips, and falls and adds to the amount of readily combustible material. All Loyola Chemistry faculty and staff have the responsibility and obligation to colleagues, students and lab personnel to adhere to safe housekeeping practices. Daily housekeeping measures must include:

1. Access to fire extinguishers, eye wash stations, safety showers, and exits must never be blocked.
2. Aisles and walkways must be cleared of chemicals, furniture or stored materials.
3. All work areas, especially lab benches should be clear of clutter and all chemicals should be returned to their proper storage area.

Because few laboratory chemicals are without hazards, general precautions for handling all laboratory chemicals have been adopted. General precautions are based on the principles of minimizing exposure, and the assumption that any mixture of hazardous chemicals is more toxic than the most toxic component. Avoiding unnecessary exposure to chemicals involves the following:

1. Do not smell or taste chemicals.
2. Toxic fumes and vapors should be vented or contained (e.g., by use of a fume hood or charcoal filter.)
3. Inspect gloves and test glove boxes before use.
4. Do not allow the release of toxic substances into cold rooms and warm rooms because these

rooms have contained recirculated atmospheres.

5. Use only those chemicals for which the quality of the available ventilation system is appropriate.
6. No eating, drinking, smoking, gum chewing or applying cosmetics or lip balm is allowed in areas where laboratory chemicals are present.
7. Do not store, handle or consume food or beverages in storage areas, refrigerators, glassware, or utensils that are also used for laboratory procedures.
8. 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.
9. Use equipment only for its designated purpose.
10. Wash areas of exposed skin thoroughly before leaving laboratory.
11. Avoid practical jokes or behavior that might confuse, startle, or distract another worker.
12. Do not pipette by mouth.
13. Confine long hair and loose clothing.
14. Wear closed-toe and closed-heel shoes at all times in the laboratory.
15. Keep the work area clean and uncluttered; clean up the work area on completion of procedure or at the end of each shift.
16. Ensure that appropriate eye protection is worn by all persons handling solutions of concentrated corrosives.
17. Wear gloves of appropriate design and construction when the potential for contact with toxic materials exists.
18. Use protective and emergency apparel and equipment as appropriate.
19. Remove laboratory coats, gloves and other protective equipment immediately upon significant contamination.
20. Consult MSDS sheets, the Chemical Hygiene Plan, a technical resource and/or safety textbooks before initiation of any unfamiliar procedure.
21. Use a fume hood for any operations that might result in release of toxic levels of chemicals, vapors or dust. As a rule of thumb, a hood or other local ventilation device should be used

when working with any appreciably volatile substance with a threshold limit values (TLV) of less than 50 ppm, as identified on the MSDS.

Note: the fume hood is intended for use with hazardous lab chemicals as defined above and in section III. It is not intended for use with common, commercially available products, such as glues, epoxies, paints and thinners. These products can generally be used with normal room ventilation and do not require handling within the fume hood. **The use of commercially-available aerosol cans, such as spray paints or adhesives, is expressly forbidden in any of Loyola Department of Chemistry hoods.**

22. Keep the hood closed to the appropriate level at all times except when adjustments within the hood are being made. Keep materials stored in hoods to a minimum, and do not allow materials to block vents or air flow. Leave the hood "on" when it is not in active use, if toxic substances are stored in it, or if it is uncertain whether adequate general ventilation will be maintained when it is "off."
23. Always be on the lookout for possible unsafe conditions in the work area and promptly address those that are identified.

VI. GUIDELINES FOR PROPER STORAGE OF CHEMICALS

The amount of each chemical stored in the laboratory will be kept as small as is practical. Storage of chemicals on bench tops and in hoods may increase the potential for spills and increase the risk of fire. Ventilated cabinets and specially monitored refrigerators are to be used for chemical storage only. No food is permitted in any refrigerator in which chemicals are stored.

1. All concentrated acids and bases are to be stored only on shelves below waist level. This practice will decrease the possibility of chemicals being knocked off higher shelves, breaking and splashing onto someone's face or body.
2. All gallon containers (or larger) of alcohol, acetone, xylene or formalin must be stored in cabinets at an appropriate level preferably below waist level.
3. No more than two gallons (or one day's supply) of any flammable liquid may be stored in any one room at any one time **UNLESS STORED IN AN APPROVED FLAMMABLE LIQUIDS CABINET.**
4. Ether must be purchased in the smallest volume available and must be stored in an open area away from flames and other sources of heat. Check manufacturer's expiration data and do not surpass.
5. Secure gas cylinders (refer to Item 9 on STORAGE and HANDLING of Compressed Gas Cylinders).

VII. GUIDELINES FOR PROPER LABELING OF CHEMICALS

1. Manufacturers' labels must be left intact. Do not cover the manufacturer's label with other labels unless the manufacturer's label does not meet current standards. If a label is damaged or removed another label should be put on the container. Never discard an unlabeled chemical, or leave it on a bench top. All chemicals that cannot be identified or rendered non-hazardous at the work site should be labeled as such and disposed of in the proper manner.
2. All chemicals, including stock reagents or chemical solutions that are prepared in the laboratory and in use for longer than a day, must be clearly labeled according to their contents. Additionally, the NFPA hazard category as identified on the MSDS is recommended for chemicals that have a rating of 3 or 4 in any given category, or are carcinogenic or radioactive. Commercially-available chemicals should offer this information already on the label from the vendor.
 1. Poison (toxic)
 2. Corrosive
 3. Flammable
 4. Explosive
 5. Carcinogenic
 6. Radioactive

VIII. PROCEDURES FOR HAZARDOUS WASTE DISPOSAL

There are general classes for chemical waste which include: solvents, acids, bases, heavy metals, pesticides, reactives, chlorinated hydrocarbons, cyanide compounds and mercury. If it is possible to keep waste separated into these categories, please do so. The following are specific examples of several categories:

Solvents	Acids and Bases	Heavy Metals	Pesticides
acetone	acetic acid	arsenic	aldicarb
benzene	ammonium solution	barium	aldrin
butyl alcohol	chromic acid	cadmium	arsenic pentoxide
cresol	ferric chloride	chromium	chlordane
ethanol	hydrobromic acid	lead	dieldrin
ethyl acetate	hydrochloric acid	selenium	endrin
ethyl ether	potassium hydroxide	silver	methyl parathion
ethyl ketone	sodium hydroxide	zinc	parathion
kerosene	sulfuric acid	cobalt	warfarin
methanol			
naphtha			
petroleum solvents			
toluene			
xylene			

Reactives by subclass

organic peroxide (benzoyl peroxide)
flammable solid (black powder)
pyrophoric (butyl lithium)
peroxide-forming solvent (isopropyl ether)
water reactive (sodium metal)
air reactive (stannic chloride)
explosive (lead azide)

To dispose of hazardous chemical wastes:

1. Obtain a container that can be closed (a bottle or can with a lid) and that will not react with the waste.
2. Construct a label and attach it to the container. The label must list the hazardous waste category and the chemical components. This is especially important for those chemicals that are in the category known as reactives. All items that are in this hazardous waste category must additionally have some sort of label on them (e.g. red tape labeled with large and clear block letters 'hazardous reactives in this container').
3. Place the labeled container in the designated waste area of the Loading Dock. Acids belong in Room LSB-129, bases belong in LSB-130, and all other flammable organics belong in LSB-133. The wastes will be picked up by Loyola's service for hazardous waste disposal.
4. Quantities of waste that are ready for disposal should not be stored in the lab.

To dispose of broken glass and sharps:

1. Broken glass should be collected in appropriately labeled broken glass containers located in each lab. The container must be clearly labeled with "Broken Glass" and must be sealed in a manner that does not endanger any individual removing the waste.
2. Sharps comprised of needles and syringes should be disposed of in properly labeled sharps red bags and left on the J-dock area for disposal by Sericycle. Sharps are disposed of at some cost by incineration, so sharps waste is not to include broken glass and Pasteur pipettes unless biologically contaminated.

IX. GUIDELINES FOR HANDLING CHEMICAL SPILLS

These guidelines cover the basic steps in handling the more common chemical spills encountered in the laboratories.

Any significant spill (> 1 L) of hazardous material must be documented with a "Report of Incident or Accident." The Security/Safety Department (Ext. 44911) and Loyola Chemistry's Safety Committee chair must be notified of significant spills of hazardous materials.

1. Acids/Bases/Solvents

- a. Put on protective garb and gloves as indicated on MSDS.
- b. Contain spill with spill kit using appropriate neutralizer or absorbent. These kits are located in every laboratory where chemicals are stored or used or are affixed to corridor-walls.
- c. Notify manager of designate,
- d. Consult MSDS regarding proper disposal.
- e. Spills on clothing or skin:
 - Remove affected clothes IMMEDIATELY. Clothing soaks up caustic liquids and makes them difficult to wash off.
 - Rinse skin thoroughly with water or use safety showers located in laboratories or hallways outside laboratories.
 - Call or visit the Wellness Center (students only) or in the case of a serious emergency contact 911 by dialing 9-911 as an outside line is required.
- f. Eye injuries:
 - Person exposed should notify and seek assistance from a co-worker.
 - Flush eyes with water from eye wash for at least fifteen minutes.
 - Call or visit the Wellness Center (students only) or in the case of a serious emergency contact 911 by dialing 9-911 as an outside line is required.
 - .

2. Dry Spills

- a. Put on protective garb and gloves as indicated in MSDS.
- b. Sweep powder spills into a plastic bag and dispose of carefully, not to raise dust (as indicated on the MSDS).
- c. Wash the area thoroughly with detergent and water.

3. Mercury Spills

- a. Sprinkle mercury spill absorbent material over the mercury particles. Wet the material with water to form a metal/mercury amalgam.
- b. Sweep up the amalgam and place in closed container (Ziploc bag will do). Follow the instructions (see section VIII) for hazardous waste disposal.

X. Guidelines for Limiting Exposures to Hazardous Chemicals

Loyola Chemistry staff who work with hazardous chemicals must do so in a manner that ensures that the individual never exceeds the permissible exposure limits (PELs) or threshold limit values (TLV

s) of the chemical in question. PEL's are the standards established by OSHA and TLV's are those established by the American Conference of Governmental Industrial Hygienists (ACGIH), but both are based on the same units of measurement and are for the most part interchangeable. These limits can be found in the OSHA table in Appendix 4 and in the ACGIH publication in Appendix 5, as well as in current MSDS's. These sources also indicate if the chemical is absorbed via the skin.

Good laboratory practice dictates the use of chemical fume hoods or other ventilated enclosures to prevent all potential exposure via inhalation of potentially hazardous vapors, aerosols and particulate. As a rule of thumb, a hood or other local ventilation device should be used when working with any appreciably volatile substance with a PEL or TLV of less than 50 ppm, as identified on the MSDS. Additionally, the use of personal protective equipment such as chemical resistant gloves and eye protection are all vital in eliminating exposures to Loyola Chemistry staff. It is the responsibility of Loyola University Chicago to take measures to ensure proper and adequate performance of fume hoods.

MSDS's are the source of information regarding what particular PPE and engineered devices are recommended. Loyola Chemistry staff shall evaluate their individual protocols involving chemicals that are hazardous and assess the exposure potential based upon the manipulations, processes, and volumes to be utilized in the specific task, assay or method in question. Staff members with questions or concern about interpretation of the published exposure limits and decisions regarding the selection of PPE needed should contact Loyola's Director of Environmental Services and LUC Chemistry Department Safety Committee Chair, or the Director of Environmental Services, William Curtin.

The OSHA Table contained in Appendix 4 references additional regulations that apply to certain hazardous reagents and might require representative exposure monitoring and medical evaluations. Loyola Chemistry laboratories using any of the following chemicals should contact Loyola's Director of Environmental Services, William Curtin for additional understanding of the hazards and potentially for additional training, if available. ***This is a partial list, included for the sake of instruction, and to raise awareness of classes of specific hazardous substances.***

Acrylonitrile
2-Acetylaminofluorene
4-Aminodiphenyl
Benzene
Benzidine (4,4' diaminobiphenyl)
3,3-Dichlorobenzidine (3,3'-dichloro-4,4'-diaminobiphenyl)
beta-Naphthylamine
beta-Propiolactone
bis-Chloromethyl ether
1,2-Dibromo-3-chloropropane
4-Dimethylaminoazobenzene
alpha-Naphthylamine
4-Nitrobiphenyl

Methyl chloromethyl ether
Aziridine (ethylene imine)
Formaldehyde/Formalin
N-Nitrosodimethylamine
Vinyl chloride
Inorganic arsenic
Lead

If air purifying respirators are required then their selection and use must comply with 29CFR 1910.134.

XI. Personal Protective Equipment (PPE)

A. Lab Coats

1. Lab coats may be worn for additional protection as appropriate.

B. Gloves

1. Appropriate gloves are to be worn by all staff whenever they handle chemicals. Unless otherwise stated on the MSDS, latex gloves are suitable for general use. In the case of sensitivity to latex, nitrile gloves should be substituted.
2. Heavy duty chemical resistant gloves such as nitrile, neoprene or vinyl are to be worn when recommended by the Material Safety Data Sheets for the substances being used and should be used when cleaning refrigerators, centrifuges, hoods, shelves, and other equipment and bench surfaces coming in contact with hazardous materials.
3. Information about appropriate glove types can be found on MSDS's, but the following general recommendations can be made:
 - *neoprene gloves for oils, acids, caustics, alcohols and solvents
 - *butyl rubber gloves for ketones and esters
 - *nitrile gloves for formalin and aromatic, halogenated, and petroleum solvents

C. Protective Eye Wear

1. Safety Glasses: To be worn when the task involves a very small volume of hazardous substance, such as pipetting solutions.
2. Safety goggles or safety glasses with side shields: To be worn when tasks involve manipulating volumes of hazardous substances where splashes could occur including pouring and mixing solutions from 100 ml to 1 liter or more.

For assistance in making informed decisions regarding the selection and acquisition of the appropriate PPE, please consult the faculty head of your lab, MSDS's or Loyola's Director of Environmental Services, William Curtin.

XII. Loyola Department of Chemistry Staff Information and Training

Loyola Department of Chemistry workers, including staff and teaching assistants, are entitled to training and information about:

1. physical and chemical hazards posed by the lab setting prior to beginning work tasks. This training and education must be documented with this department and includes information on precautionary measures or specific procedures to be followed in order to reduce or eliminate exposure to hazardous compounds. Every teaching assistant or laboratory instructor who works directly with lab chemicals must read the Department of Chemistry's Chemical Hygiene Plan and receive additional training on safe lab practices. This rule does not apply to workers who may, during the course of their work, use only common, commercially available products with chemicals in them, such as glues, epoxies, paints, thinners, aquarium products, etc.
2. the signs and symptoms of an exposure to a hazardous chemical, and the institution's procedure for medical examination and consultation as well as Emergency medical assistance.
3. lab chemicals in use that require exposure monitoring (see list in section X). The results of monitoring tests will also be made available to employees.
4. the use, existence and location of the Material Data Sheet repository and this document, the Loyola Department of Chemistry's Chemical Hygiene Plan. This Chemical Hygiene Plan and a computer shortcut to the MSDS online database are to be kept electronically in the Chemistry Department server.
5. the Federal Standard, *Occupational Exposure to Hazardous Chemicals in Laboratories-29CFR 1910.1450* available online at http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=standards&p_id=10106.
6. the location and availability of PPE, chemical fume hoods, fire extinguishers, evacuation routes, chemical spill control materials, and other relevant materials.

XIII. EMERGENCY PHONE NUMBERS

General

Serious Emergency – call first

911 (dial 9 *then* 911 on campus,
as an outside line is required.)

Campus Security (in the event of serious injury)

44-911

Ambulatory injury Student Wellness Center
(Students only) 1052 W. Loyola Avenue

8-2530

Poison Control (anywhere in the United States)

1-800-222-1222