CHEMICAL HYGIENE PLAN AND SAFETY GUIDELINES

Version 6.00: Approved by the Chemistry Department April 4, 2018

UNIVERSITY OF WISCONSIN-EAU CLAIRE

CHEMISTRY DEPARTMENT AND CHEMICAL STOCKROOM

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The intent of this chemical hygiene plan for the Chemistry Department is:

1. To protect laboratory employees and students from health hazards associated with the use of hazardous chemicals in our laboratories.

2. To assist the university's regulatory compliance with the appropriate OSHA Laboratory Standards.

3. To assist the university's regulatory compliance in handling of hazardous materials.

4. To assure that laboratory employees and students are not exposed to substances in excess of the permissible exposure limits.

This plan will be available to all employees and students for review. This plan will be reviewed annually, or more frequently as needs might arise, and updated as necessary by the Chemistry Safety Committee and the Chemistry Department.

I. Responsible individuals under the Chemistry Department's Chemical Hygiene Plan are:

1. Chemistry Department Chair

2. Chemistry Department Chemical Hygiene Officer

3. Safety Committee Members

4. Laboratory Supervisors and Chemical Stockroom Manager, each laboratory instructor or research director

5. Authorized Student Assistants

6. Students participating in the Chemistry Department Outreach Program

Specific Roles of Individuals or Groups:

The Chair of the Chemistry Department shall designate a Chemical Hygiene Officer who has primary departmental responsibility for the implementation and maintenance of this plan. The Chair shall also designate a departmental safety committee to assist in the responsibilities outlined in this plan.

Chemical Hygiene Officer (CHO)-Shall organize or conduct laboratory inspections, suggest modifications to CHP (Chemical Hygiene Plan), enforce the CHP, and serve as a resource clearinghouse for persons working in the department.

Safety Committee: Shall organize or conduct lab inspections and work with the CHO to maintain and improve lab safety.

Supervisors of students, whether in a research or instructional laboratory, chemical stockroom, or demonstration setting, shall assume responsibility for the safe design and implementation of experiments.

II. General Policies and Practices

Part 1. Personal Protective Apparel and Equipment

1. Goggles or Other Eye Protection. All employees, visitors, and students must wear approved eye protection in chemistry laboratories or the chemical stockroom when risk of damage to the eye exists. It is the responsibility of the laboratory supervisor (e.g. teaching faculty, stockroom manager, or research director) to determine when a risk of injury is present and insure that appropriate eye protection is worn.

2. In instructional laboratories, research laboratories, or the chemistry stockroom, eye protection is required at all times at which a risk of chemical splash is present including: solution preparation activities, transferring liquids between containers, conducting reactions or purification techniques using liquids, transporting cryogens, and the handling of hazardous materials.

3. Safety goggles approved for use in instructional laboratories give maximum eye coverage from a liquid splash. The edge of the goggles must seal to the face. Air must be able to enter indirectly only, through a covered baffle. Goggles are not appropriate for chemical splash if they have holes that would allow a liquid to pass directly through the goggle's side.

4. Research laboratories may have the chemical splash hazards listed above, experiments that involve concentrated acids and bases, as well as optical hazards from lasers and other strong light sources or explosion and impact hazards from pressurized or evacuated equipment. This work requires extra precautions. The laboratory supervisor shall require the appropriate eye protection such as glasses or goggles to filter light, safety goggles or face shields to protect from implosion. The supervisor may also require that the experiment be conducted in a hood with a safety window.

5. Low Risk Conditions. Eye protection will not normally be required in the following situations:

   (a) Instructional laboratories when no risk of chemical splash exists including: a lecture presentation, a quiz, or during experiments without risk of chemical splash.

   (b) The use of special instruments such as refractometers, etc., which require direct eye reading. However, proper eye protection must be worn when not actually involved in the readings.

6. Availability of Eye Protection. Students in instructional labs are required to have their own safety goggles (meeting the ANSI Z87.1-1989 standard for chemical splash/impact). Eye protection is available for purchase from the University Bookstore.

7. The use of contact lenses in the laboratory is not recommended.

8. Protective gloves may be needed for some procedures. The type of glove selected should protect against the chemical being used, or against heat, cold, and sharp objects. Gloves should be worn for work with strong corrosives or with acutely toxic chemicals. Prior to starting work, a reference

guide or chart should be consulted to make sure that the glove will be protective for the chemical and length of exposure.

9. The use of lab coats or aprons is optional depending on the laboratory supervisor or instructor. The supervisor should consider the hazards of the material and scale of the operation when determining whether to use a lab coat or apron.

10. Face shields or safety shields should be used in laboratory operations which have the potential to result in fires or explosions or which utilize pressurized or high vacuum operations. Prior authorization of the lab supervisor is required. Check the safety equipment (fire extinguishers, shields, safety showers, etc.) prior to such operations.

Part 2. Personal Behavior and Clothing, etc.

1. No food or beverages may be prepared, consumed or stored in the laboratory. If the laboratory experiment involves food or beverages, they must be clearly labeled "Not for human consumption" (or equivalent).

2. No personal care products (make-up, lotions) should be applied in labs, except soap for washing.

3. It is recommended that all persons should wash their hands after a lab experiment, and as often as needed during an experiment.

4. Clothing worn in the laboratory should be comfortable and not restrict motion yet not so loose (especially sleeves) as to catch on equipment. The flammability of the fabric should be considered.

5. It is recommended that sturdy shoes that cover your feet should be worn, because sandals and open-toed shoes may not provide the necessary protection from laboratory spills and accidents. Laboratory supervisors may ask students to leave if the student's footwear is inappropriate.

6. Long hair should be tied back to keep it away from flames and chemicals.

7. Personal protective equipment must be worn at all times when using, transferring, or transporting cryogenic liquids in unsealed containers or when working with evacuated containers.

Part 3. Safety Features and Equipment in Laboratories

1. Laboratory hoods shall be used for all operations that have the potential to produce hazardous levels of fumes, gases, or volatile solvent vapors. Laboratory hoods shall not be used as long term chemical storage areas. Working quantities of reagents may be stored in the hood during the duration of the experimental work. Equipment (such as variacs) for use in a hood should not be located on stools outside the hood.

2. Adequate ventilation is essential for maintaining safe levels of exposure. It is the responsibility of the laboratory supervisor to stop laboratory operations if ventilation is judged to be inadequate for any reason. The failure of fume hood systems may be grounds to terminate laboratory operations.

3. Eye wash stations and emergency drench showers are provided in case of chemical exposure to eyes, skin, or clothes. Clear access to eyewash stations and safety showers must be maintained by the lab supervisor and users.

4. Fire Extinguishers should be provided appropriate to the flammability hazards present in each lab. Clear access to fire exits and fire extinguishers must be maintained by the lab supervisor and users.

5. Labs should be kept free of trip hazards.

Part 4. Signs and Labels

1. Appropriate signage will be placed on laboratory doors/entryways, in laboratory areas, and in chemical storage areas. This signage will include: **Eye Protection Policy In Force: See Laboratory Supervisor** (or equivalent) on all entryways leading to laboratories or to chemical storage areas. All laboratory doors will be posted with the name and both work and home telephone numbers of the responsible laboratory supervisor and backup personnel. The Laboratory Supervisor or Chemical Stockroom Manager is responsible for keeping this signage current in consultation with the Chemical Hygiene Officer.

2. Laboratory doors will be posted with a map indicating location of storage of general classes of compounds with storage areas indicated with the National Fire Protection Association (NFPA) standard codes.[1] This map will be accurately filled in with the appropriate hazard codes by the Laboratory Supervisor or Chemical Stockroom Manager in consultation with the Chemical Hygiene Officer.

3. All bottles or other containers for permanent storage of chemicals in laboratory teaching areas will be labeled with the NFPA standard warning label and full name of contents.

4. Each research lab shall have a consistent labeling system for samples prepared for use in that lab. The system shall be posted in the lab.[2]

5. Internal laboratory signage will be posted to minimize inadvertent sink disposal of chemicals.

6. All hazardous waste accumulation containers in the laboratory will be labeled Hazardous Waste. Containers must also be labeled with the following information. Full name of Contents (not chemical formula); Responsible person (Lab Supervisor), Class number or research group, Information on the hazard classes of the contents.

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[1] This diamond shaped symbol has a region describing Health Hazard (blue), Flammability Hazard (red), Instability/Reactivity Hazard (yellow), and an area for designating the specific reactivity hazards (e.g. Oxidant "OX" or water reactive ~~W~~.) A rating of 4 is most hazardous, and a rating of 0 is non-hazardous.

[2] Information that should be included at minimum for labeling of experimental samples is given in **Prudent Practices in the Laboratory: Handling and Disposal of Chemicals,** by the Committee on Prudent Practices for Handling, Storage, and Disposal of Chemicals in Laboratories, Board on Chemical Sciences and Technology, Commission on Physical Sciences, Mathematics, and Application, and National Research Council; National Academy Press, 1995, pp. 71-72.

7. Food, beverages, pharmaceutical, and personal care items in lab shall be labeled "Not for human consumption" (or equivalent).

Part 5. Chemical Procurement, Distribution, and Storage

1. Ordering of Chemicals. Chemicals shall be ordered through the stockroom, in accordance with the Arts and Sciences Purchasing policy.

2. Distribution of Chemicals. When chemicals arrive, the stockroom personnel will contact the faculty or staff member who has ordered the reagent. The reagent can be picked up in the stockroom.

3. Return refillable and reusable solvent containers to the stockroom window.

4. All other empty chemical containers should be triple-rinsed, marked Empty and deposited in the specially marked container by the Stockroom window, Room P410. The Inventory bar code label should be left on the bottle in order that the chemical can be removed from the inventory.

5. The quantities of chemicals shall be kept to a minimum in working laboratories.

6. These minimal inventories shall be stored in a safe manner using chemical safety cabinets for flammable chemicals and acid cabinets (or other appropriate storage such as secondary containment). Chemicals shall be segregated by chemical characteristics to avoid incompatibilities such as strong acids and bases stored adjacent to each other. Alphabetical storage sequences are not adequate if chemical characteristics are ignored.

7. All chemical containers shall be kept capped or lidded when chemicals are not being withdrawn - or not being added, as in the case of hazardous waste accumulation containers.

8. The purchase, preparation, or gift of particularly hazardous compounds (e.g. explosive compounds, pyrophoric compounds, extremely poisonous compounds, biohazardous compounds, etc.) that are to be used in the Chemistry Department will be brought to the attention of both the CHO and the chair of the department. The presence of all such hazardous compounds will be brought to the attention of the staff of the department. All such compounds will be added to the chemical inventory maintained by the stockroom.

9. Student samples stored outside an instructional lab, or for example in a refrigerator in the lab, should have the student's name, a date, and the relevant experiment name. Appropriately labeled batch storage of student samples is acceptable.

10. All chemical preparations that are unknowns should have the preparer's name on the label, together with the course number and the date, and a comment such as "acid unknowns" on the label.

11. Potentially hazardous chemicals should not be returned to an unattended stockroom.

12. Course supervisors may for selected classes allow students to check out chemical supplies from the stockroom, with an appropriate faculty signed check-out card. The course instructor should communicate his/her intention to do this to the stockroom manager.

Part 6. Use and handling of carcinogens, teratogens, mercury, and controlled substances

The stockroom has a list (called Appendix J, available from the Stockroom Manager) of OSHA regulated substances that is available for check-out by faculty members, research students, and staff. Follow these general rules to minimize the risk during use.

General rules for carcinogen use

1. Check out the minimum amount of the required chemical.
2. Transport chemical to the laboratory by placing vessel in an unbreakable outer container.
3. Store in leak-proof containers in a well ventilated area.
4. Minimize personal contact of faculty and students.
5. Collect or trap all carcinogenic waste materials and store in leak-proof containers for disposal by the Campus Environmental Health and Safety Manager.
6. All listed carcinogens must be used in laboratory fume hoods according to special procedures outlined in the Laboratory Standard in order to minimize exposures.
7. Special procedures are required by OSHA regulations for many chemicals, e.g. benzene and formaldehyde. The laboratory standard preempts these substance specific regulations, but they include useful information for experimental design and precautionary measures.

Part 7. Hazardous Waste

1. All Hazardous Waste containers shall be kept capped or lidded when chemicals are not being added.

2. All Waste Containers for liquids will be provided with secondary containment adequate to contain the volume of the container.

3. Waste Containers must be labeled with the following information. “Hazardous Waste” Full name of Contents; Responsible person (faculty or staff), Class number or research group, Information on the hazards of the contents. Labels should list only a single name for each compound (e.g. not both ethanol and ethyl alcohol) and should not use a chemical formula.

4. Waste Containers must be filled only up to 90% of the capacity of the container.

5. The outside of the container should be clean and free of any residue, the cap should fit securely, and the label should be legible.

6. When the container is 90% full, the experiment is concluded, or no additional material of the same category is expected for that lab, the campus hazardous waste coordinator should be informed of the location of the bottle for pick up.

7. Some compounds have been allowed by local sewer authorities for sink disposal, or by local landfill authorities for solid waste disposal. The Chemical Stockroom has a list (Appendix F) of compounds that have been approved for sink or landfill disposal.

8. Syringe needles must be disposed of in the appropriate container (available from the stockroom).

The waste storage location should be readily apparent to someone working or entering the lab. Waste should not be stored in out-of-the-way locations.

Waste labels must not be placed on any container for which the contents are to be disposed of in the sink or in the normal trash.

Part 8. Training Information-Employees, Students, and others in the Department

1. Training for faculty and academic staff of the department will be done annually by persons from the Office of Loss Prevention and Safety on the topics of laboratory safety and hazardous waste training. Visiting scientists when appropriate will also receive this training.

2. Each student employee covered under this standard will be provided with information and training to inform them of the hazards of the chemicals present in their work areas. This training will be provided at the time of their initial assignment and prior to any new assignments involving different exposure situations. This training will be provided by the laboratory supervisor. Visiting student research assistants will also receive safety training provided by the laboratory supervisor. Refresher training will be provided at a minimum of once yearly by the laboratory supervisor. Laboratory supervisors will turn in training forms at the beginning of the following periods for their students: Fall Semester and Winterim, Spring Semester, Summer Session. [3]

3. The laboratory supervisor must approve any experiments using carcinogens, teratogens, or chemicals which have the potential to become acute hazardous wastes. The Chemical Stockroom has a list (Appendix D) of acute hazardous wastes. Student employees must receive training addressing the specific hazards and appropriate personal protective equipment required. This work may require closed containment systems such as glove boxes or special glassware and equipment.

4. Student laboratory assistants will be provided training prior to their supervision over other students. Training will also be provided for students participating in the Chemistry Department Outreach Program. This training will be provided at the beginning of each semester by the laboratory supervisor or by the Outreach Coordinator.

5. Custodians assigned to the Chemistry Department will be advised to consult with a Chemistry faculty member, the Chemistry Department Chemical Hygiene Officer, and or the department chair, whenever a situation of safety concern arises.

6. Records of all employee training will be maintained by the Chemistry Department Safety Officer. Training requirements can be found on the UWEC Chemistry Department Student Laboratory Collaborator Safety Training Report Form[4]. The Chemical Stockroom keeps a list (Appendix H) in outline form.

[3] See Attachment 3: UWEC Chemistry Department Student Laboratory Collaborator Safety Training Report Form.
[4] See Attachment 3: UWEC Chemistry Department Student Laboratory Collaborator Safety Training Report Form.

7. Students enrolled in classes will be provided training[5] during initial laboratory sessions of each course. Such training will be incorporated in the described curriculum, documented via student signature on a training acknowledgement form.

8. Outside contractors, or campus-supplied workers from such areas as Facilities Management, must be informed of the hazards to which they might be exposed while working in the laboratory environment by the Chemistry Department Chemical Hygiene Officer.

9. A UWEC chemistry faculty/staff member working in another UWEC department or functional unit is bound by the Chemistry Department CHP and by additional HPs in force in the other setting. When other plans are in conflict with the Chemistry Department CHP, the individual will work with the CHO, and other interested persons to resolve such conflicts.

10. A UWEC faculty/staff member from another department when teaching a class in the UWEC Chemistry Department is bound by the operating principles of the Chemistry CHP.

11. A faculty/staff member from another university when working in the UWEC Chemistry Department is bound by the UWEC Chemistry CHP.

Part 9. Supervision of Undergraduate Students and Undergraduate Research Assistants

1. In teaching laboratories the instructor will be present in the laboratory or in close proximity during scheduled laboratory hours and other times when students are doing laboratory work.

2. In research laboratories the research supervisor or designated faculty supervisor will be present in the laboratory or available in the department for consultation and supervision of the work.

3. The degree of supervision for research students employed in various circumstances requires the judgement of the faculty supervisor and will vary with the risks involved. However, in no circumstances are students allowed to conduct potentially hazardous procedures when the faculty supervisor, or designated substitute, is not present in the department.

4. Projects such as data analysis, computational projects, or certain types of spectroscopic measurements do not require the presence of a faculty supervisor.

5. Requests for exceptions must include a written description of the procedure and be signed in advance of the work by the Chair of the Chemistry Department.

6. External wiring on all electrical equipment (including computers) should be appropriately monitored. Damaged chords should be repaired or replaced.

The safety training forms for research students should be signed by faculty supervisors and their research students.

[5] See Attachment 2: University of Wisconsin Statement on Safety and Health Policy.

Specialized training for work with particularly hazardous compounds (or equipment) be documented in writing, with a copy to the student and CHO. A form signed by the student indicating training has been received is recommended.

Part 10. Accidents and Spills

Emergency Action: Any accidents, injuries, or spills of chemical reagents or hazardous waste must be reported to the Laboratory Supervisor immediately.

Injuries: Go to a phone and dial 9-911; or use a cell phone.

Fires: Pull the fire alarm, or go to a phone and dial 9-911; or use a cell phone.

Minor spills: Can be cleaned up by the laboratory personnel or supervisor if they are knowledgeable of the hazards and have appropriate training and equipment. For larger or more **serious spills** of chemical reagents or hazardous waste, call Randy Saheim (office #839-3999, pager # 36-4800, *602)

Reporting Accidents. The laboratory supervisor is responsible for completing the Injury, Accident, or Incident Report form (included as Attachment 7), and giving the form to the stockroom or Chemical Hygiene Officer. The Chemical Hygiene Officer will save these forms.

The UWEC Chemistry Department requires that an **Injury, Accident, or Incident Form** be filled out for the following:

1. Personal injuries, such as those incurred because of cuts, burns, electric shock, etc.
2. Unplanned fires.
3. All mercury spills.
4. Strong acid and base spills exceeding approximately 100 mL.
5. All major spills of toxic chemicals.
6. Gas leaks or unplanned discharges of a gas.
7. Water spillage exceeding approximately 10 Liters.

For injuries to students or employees, a copy of the form (Attachment 7), should be sent by the Chemical Hygiene Officer to the Office of Loss Prevention and Safety.

Part 11. Medical Consultation and Examination[6]

The Laboratory Standard mandates that employers provide medical attention, examinations, and follow-up examinations at the physician's discretion. Medical attention, etc. is required under the following circumstances:

[6] Consult Prudent Practices in the Laboratory: Handling and Disposal of Chemicals, pp. 223-224 on Medical consultation and medical examinations.

1. Whenever an employee develops signs and/or symptoms associated with a hazardous chemical to which they may have been exposed; or

2. Whenever exposure monitoring reveals an exposure level above the OSHA action level or exposure above the permissible exposure level for OSHA regulated substances; or

3. Whenever an event takes place in the work area such as a spill, leak, explosion, or other occurrence that results in the likelihood of a hazardous exposure. Such an occurrence requires an option for medical consultation for the purpose of determining the need for a medical examination.

The laboratory supervisor, or when this individual is unavailable, the Chemistry Department Chemical Hygiene Officer, or the Chair of the Chemistry Department, shall provide the examining physician the following information:

1. Identity of the hazardous chemical to which the employee may have been exposed,

2. A description of the conditions of exposure including exposure date if available,

3. A description of the signs and symptoms of exposure, if any, that the employee is experiencing, and

4. A copy of the relevant SDS (formerly the MSDS).

The Chemistry Department Chemical Hygiene Officer will maintain a file concerning any incident that requires medical attention. The incident shall be reviewed by the Chemistry Department Safety Committee to ensure that the possibility of a similar kind of incident in the future is minimized.

In the event that first aid or other medical consultation is sought, the Office of Loss Prevention and Safety will be asked for any additional information on the hazard, and kept informed of the process and results of the consultation.

Part 12. Inspections, Maintenance, Monitoring, Record-keeping.

1. Members of the departmental safety committee and the CHO are responsible for conducting periodic laboratory inspections.

2. The safety committee will announce a time window during which inspections will be held. Inspections will be conducted at least annually. Occasional inspections shall be conducted while the laboratory is in use so that the operating procedures may be verified.

3. The inspection checklist[7] and copy of any report made by an inspector from the UWEC campus shall be made available to the individual(s) responsible for the lab within ten working days.

[7] The Chemical Stockroom keeps a list.

4. The schedule of all inspections, checklists, and reports will be kept in the Chemistry Department Safety Committee files.

5. Inspections of the safety equipment and engineering controls will be done in cooperation with other local university offices with appropriate technical expertise as follows:

   (a) Laboratory hoods will be inspected biannually by a person designated by the Office of Loss Prevention and Safety (OLPS). OLPS shall maintain a record of these inspections and report the results to the Chemistry Department Chemical Hygiene Officer. Hood face velocities will be determined by hot wire anemometer readings taken over a grid across the open hood face. A sticker program will document the face velocity and date of inspection; the stickers will be posted on the right hand side of the fume hoods at about eye level. Improper use of fume hoods for chemical storage will be reported to the Chemistry Department Chemical Hygiene Officer for corrective action. Inadequate hood operation – face velocities less than 100 ft/min – will be reported to Facilities Management for corrective action. Hoods with inadequate face velocities will be prominently marked as not suitable for safe use until repaired.

   (b) Safety shower inspections will be conducted regularly by a person designated by the Office of Loss Prevention and Safety. The results of the inspections will be available from the Campus Environmental Health and Safety Manager.

   (c) Eye wash stations will be inspected regularly by a person designated by the Office of Loss Prevention and Safety. The results of the inspections will be available from the Campus Environmental Health and Safety Manager.

6. (d) Fire extinguisher inspections will be conducted a minimum of once a year by an external contractor. Any deficiencies of fire extinguishers in terms of number of extinguishers or locations of extinguishers will be brought to the attention of the Superintendent of Building and Grounds, Facilities Planning by the laboratory supervisor or the Chemistry Department Chemical Hygiene Officer.

7. (e) Air quality monitoring will be conducted in operating laboratories as requested by the Office of Loss Prevention and Safety, especially when laboratory employees or supervisors report conditions that might lead to excessive exposure levels. An industrial hygienist from the UW System Administrative Office of Loss Prevention and Safety, Environmental Health and Safety Department, is available upon request to perform air monitoring at no cost to the department. The results of the air quality monitoring will be available from OLPS. The Chemistry Stockroom maintains information on the details on air quality monitoring procedures (Appendix I).

Part 13. Enforcement of Chemical Hygiene Plan

The Chemistry Department Chemical Hygiene Officer, with co-approval of the Chemistry Department Chair, and consultation with the laboratory supervisor, shall have the authority to suspend laboratory operations – in part, or in the whole – if deficiencies in laboratory procedures or equipment pose a significant threat to the safety of the laboratory personnel or students. Written appeals under this procedure should be made to the Dean of Arts and Sciences with contact made with the Office of Loss Prevention and Safety.

If indefinite suspension of laboratory operations is necessary, a written report will be filed with the Office of Loss Prevention and Safety and with the Dean of the College of Arts and Sciences within 24 hours. A copy of the report with a written description of remedial actions to be taken to allow resumption of operations will be available in the Chemistry Department Safety Committee files.

ATTACHMENTS

Attachment 1

UWEC CHEMISTRY DEPARTMENT STUDENT LABORATORY COLLABORATOR SAFETY TRAINING REPORT FORM

State of Wisconsin regulations mandate certain provisions for documentation of training of employee/students whose assigned activities may expose them to chemical and physical hazards in the laboratory setting. Nominally formal laboratory courses achieve this requirement through class rosters developed by registration. This form is intended to extend coverage to student laboratory collaborators, including directed study and independent study students. The minimum training requirements applicable to such student laboratory collaborators are outlined on the reverse side of this form and are the specific responsibility of the immediate supervisor. **By signing this form, the supervisor certifies that the initial safety training has been provided to the students listed and agrees to be responsible for further training as needed to work in the supervisor's laboratory. The student signature certifies that they have received the indicated training.**

Directions: Please return the completed form to the Chemistry Department Chemical Hygiene Officer (CHO) by the end of the third week of each reporting term. If additional student laboratory collaborators need to be reported after this date, the appropriate form is on line at http://www.chem.uwec.edu/king/safety.html .

Supervisor's Name:_____

Supervisor's Signature:_____ Date:_____

Reporting Period: 2018 – 2018

□ Fall Semester + Winter Interim
□ Spring Semester + Spring Interim
□ Summer Session

Supervised Students Extended Training:

1. Students's Name:_____ (please print) Students's Signature:_____
2. Students's Name:_____ Students's Signature:_____
3. Students's Name:_____ Students's Signature:_____
4. Students's Name:_____ Students's Signature:_____
5. Students's Name:_____ Students's Signature:_____
6. Students's Name:_____ Students's Signature:_____
7. Students's Name:_____ Students's Signature:_____
8. Students's Name:_____ Students's Signature:_____
9. Students's Name:_____ Students's Signature:_____
10. Students's Name:_____ Students's Signature:_____

See back side of form (following page)

Elements of Appropriate Safety Training for Student Laboratory Collaborators

Authorization:

UWEC Student Services and Standards Manual, RE: University of Wisconsin Statement on Safety and Health Policy

Wisconsin Administrative Code, Department of Industry, Labor and Human Relations, Chapter ILHR 32, Safety and Health Standards for Public Employees

Student laboratory collaborators who are not employees are included under the Right-To-Know Law (Wisconsin Statute 101.58)

Required Information and Training:

At a minimum, training and information requirements must include the following:

1. Signs and symptoms associated with exposure to hazardous chemicals: refer to SDS's (formerly the MSDS).
2. Specific procedures which are to be put into effect to provide protection, including engineering controls (hoods, safety showers, fire extinguishers, etc.), work practices, personal protective equipment, etc., if appropriate for the work to be done.
3. Procedure to follow if an exposure incident or accident occurs. For very minor cuts, use the first aid resources available in each lab. For accidents involving more than minor cuts, go to the student health services. Other situations, as appropriate, will be discussed by the lab supervisor.
4. Methods and observations that can be used to detect the presence of hazardous materials, i.e., visual appearance or odor, etc.
5. An explanation of the modes of transmission for blood borne pathogens and instructions in the use of potentially infectious materials and biohazardous agents, if appropriate for the work to be done.
6. Appropriate hazardous waste disposal techniques. It is recommended that each experiment, procedure, or exercise include written instructions concerning the proper disposition of wastes generated.
7. Discussion of safe handling and storage of hazardous chemicals, including the appropriate labeling to be employed. It is recommended that each experiment, procedure, or exercise include written instructions concerning the proper disposition of wastes generated.
8. The existence and availability of the Chemistry Department Chemical Hygiene Plan.
9. The existence and the provisions (as appropriate) of the Occupational Exposure to Hazardous Chemicals in Laboratories Standard, 29 CFR Part 1910, Federal Register. A summary pamphlet entitled "Exposure to Hazardous Chemicals in Laboratories", OSHA 3119, is available from the W. D. McIntyre Library. A copy will be available from the CHO.
10. Location and availability of known reference materials on the hazards (physical, chemical & health), safe handling, storage and disposal of hazardous chemicals, including the rudiments of proper labeling. Nominally this information is available in the Safety Data Sheets (SDS) (formerly the MSDS's), in part, located in Phillips 456. SDS's (or MSDS) are available on the web from multiple sources.
11. Permissible exposure limits for regulated substances and recommended exposure limits for other hazardous chemicals where no OSHA standard applies (refer to SDS's).
12. Where appropriate, instruction on the proper transport of cryogens in unsealed containers, or on the proper procedures for working with evacuated containers.

All such information shall be provided at the time of the collaborator's initial assignment to the work area where hazardous chemicals are present and subsequently whenever new exposure situations arise.

In addition, supervisors of student collaborators are encouraged to regularly consult with the CHO for recommendations on additional safety training options.

Attachment 2

CHEMISTRY DEPARTMENT DEMO SHOW STUDENT SAFETY TRAINING FORM

State of Wisconsin regulations mandate certain provisions for documentation of training of employee/students whose assigned activities may expose them to chemical and physical hazards. This form is intended to extend coverage to students involved in the Demo Show. The minimum training requirements applicable to such students are outlined on the reverse side of this form and are the specific responsibility of the immediate supervisor. **By signing this form, the supervisor certifies that the initial safety training has been provided to the students listed and agrees to be responsible for further training as needed for students to work with the Demo Show. The student signature certifies that they have received the indicated training.**

Directions: Please return the completed form to the Chemistry Department Chemical Hygiene Officer (CHO) by the end of the third week of each reporting term. If additional student demo show participants need to be reported after this date, the appropriate form is on line at http://www.chem.uwec.edu/king/safety.html .

Supervisor's Name:_____

Supervisor's Signature:_____ Date:_____

Reporting Period: 2016 – 2016

□ Fall Semester + Winter Interim
□ Spring Semester + Spring Interim
□ Summer Session

Supervised Students Extended Training:

1. Students's Name:_____ Students's Signature:_____
   (please print)
2. Students's Name:_____ Students's Signature:_____
3. Students's Name:_____ Students's Signature:_____
4. Students's Name:_____ Students's Signature:_____
5. Students's Name:_____ Students's Signature:_____
6. Students's Name:_____ Students's Signature:_____
7. Students's Name:_____ Students's Signature:_____
8. Students's Name:_____ Students's Signature:_____
9. Students's Name:_____ Students's Signature:_____
10. Students's Name:_____ Students's Signature:_____
11. Students's Name:_____ Students's Signature:_____
12. Students's Name:_____ Students's Signature:_____
13. Students's Name:_____ Students's Signature:_____
14. Students's Name:_____ Students's Signature:_____
15. Students's Name:_____ Students's Signature:_____
16. Students's Name:_____ Students's Signature:_____

See back side of form (following page)

Elements of Appropriate Safety Training for Student Demo Show participants.

Required Information and Training:
At a minimum, training and information requirements must include the following:

13. Proper use of approved eye protection.
14. Safe handling of liquid nitrogen.
15. Proper treatment of hazardous waste in demo room and when travelling.
16. Proper approval of new demos by the faculty Demo Show coordinator.
17. Know the location and proper use of:
    a. Sinks
    b. Eye wash fountain
    c. Safety shower
    d. Fire blanket
    e. First Aid kit and supplies
    f. First Aid manual
    g. Chemical Hygiene Plan
    h. Fire Extinguisher
    i. Emergency exits
    j. Nearest phone
    k. Safety data sheets (formerly the MSDS) (in P456)
    l. Accident report forms
18. Special procedures appropriate to each particular demo.

All such information shall be provided before a student begins work with the demo show.

Attachment 3

SAFETY POLICY REGARDING HANDLING OF COMPRESSED GAS CYLINDERS

1. Compressed gas cylinders must be securely strapped to a bench-top or wall at all times, except when being moved.

2. Whenever a gas cylinder is moved, the regulator must be removed and the protective cap must be in place.

3. If a cylinder is moved more than a few feet, a cylinder cart must be used, with the cylinder strapped down and the protective cap in place.

Attachment 4
SAFETY POLICY FOR BODY FLUIDS

Department policy is to comply with the OSHA - Blood Borne Pathogen Standard, 29 CFR 1910.1030, ILHR 32.15, and ILHR 32.50, regarding blood and other potentially infectious materials (OPIM).

A. Education

1. Chemistry faculty, employees, or students involved in courses or research using blood or OPIM, are provided specific training regarding proper handling and disposal precautions and procedures.
2. All faculty, employees, and students are informed of the precautions and risks. Faculty will provide and document training for students engaged in research or enrolled in classes that use blood or OPIM.
3. Laboratory supervisors will be responsible for the creation and maintenance of specific written procedures pertinent to their laboratory operations.

B. Precautions

1. All control materials, patient samples, or accidental spills are assumed to be potentially infectious. Universal precautions will be taken.
2. Mechanical pipetting devices are used for the manipulation of all liquids.
3. Hoods and/or containment devices such as centrifuge safety caps are used whenever procedures are conducted that have a high potential for creating aerosols or infectious droplets. These include centrifuging, blending, sonicating and vigorous mixing.
4. Disposable latex gloves will be worn when working with blood or OPIM.
5. All employees and students will thoroughly wash their hands following completion of laboratory activities involving blood or OPIM. Hand-washing will immediately follow removal and disposal of gloves.

C. Collection of Samples

1. Only sterile disposable lancets are used for obtaining student blood samples.
2. No student or faculty is required to give his/her own blood or OPIM or to obtain the blood or OPIM of others.

D. Disposal/Decontamination

1. Lancets and needles used for obtaining or transferring blood or OPIM are promptly placed in an appropriately labeled, puncture-resistant, disposal container.
2. Glassware (e.g. beakers and graduated cylinders) used in collecting and processing of saliva are soaked for 10-15 minutes in freshly prepared 10% bleach (1:10 dilution of household bleach), washed and reused.
3. Laboratory table surfaces, contaminated or possibly contaminated, are cleaned with an appropriate disinfectant immediately upon completion of work with blood or OPIM.
4. Gloves are provided for laboratory work, glassware cleaning and decontamination.
5. Solutions containing blood products or OPIM are made to 10% final concentration of bleach, placed in a container, and stored overnight before disposal.
6. Special biohazard bags will be supplied in each teaching laboratory for collection of biohazard, potentially-infectious waste. The laboratory supervisor will be responsible for transporting these bags to the Biohazard Waste Container located in Room 466. Checkout of a replacement biohazard bag from the Stockroom will be the responsibility of the laboratory supervisor.

7. The OPIM Waste Coordinator (Dr. Hati) will be responsible for the autoclaving or proper disposal of all potentially-infectious waste, and for maintenance of a log documenting all OPIM wastes collected, including the weight, date, treatment, and disposal methods for all OPIM wastes.

Summary of Key Concepts

1. **Universal Precautions** means treating all blood or other potentially infectious material as though it were contaminated with disease-causing organisms.
2. **Other Potentially Infectious Material (OPIM)** means any bodily fluids which may be contaminated with blood or other infectious fluids. Small or large sharps are also OPIM.
3. **Sharps** are things like needles, razors, or broken glass. They must be treated as if contaminated. Do not pick them up with your bare hands. They must be placed in proper containers for proper disposal.
4. **Regulated waste** is anything contaminated with blood or OPIM that it drips or would release liquid if squeezed. Such materials can also release flakes if dried. This kind of waste must be specially handled and disposed of in accordance with particular regulations
5. **Disinfectant** means a strong bleach solution or a strong quaternary ammonium salt solution. Commercial disinfectants are available and should be labeled as effective against the Hepatitis B organism.
6. **Parenteral** means through the skin as by injection or penetration such a needle stock or puncture by any object.
7. An **exposure incident** is any event which has the likelihood of exposing employees or students to infectious agents. In particular these events are specific eye, mouth, other mucous membrane, non-intact skin, or parenteral exposure to blood or OPIM.
8. **Follow-up procedures** are mandated after any exposure incident. These include free medical evaluations.
9. All employees are eligible for a free vaccination against the Hepatitis B virus. If employees do not want the vaccination, they must sign a form so-saying. If they change their mind, they can always obtain a free vaccination in the future. Students are not eligible for a free vaccination, but they must be informed that vaccinations are an option which they might elect to have for their own protection.
10. All employees and students must have training prior to work which may expose them to blood or OPIM.
11. All employees and students must have access to personal protective equipment such as gloves before work which may expose them to blood or OPIM.

DO'S:
Wear gloves
Wear lab coats

Wash hands
Remember "universal precautions"
Use disinfectant
DO NOT'S:
Pick up "sharps" with hands
Reach into containers with unprotected hands
Forget "universal precautions"
Be sloppy
Forget to wash hands

Attachment 5

Instrument Maintenance Request Form

Equipment Name:_____Chem Dept Tag No._____ Univ Tag No._____

Problem:

_____

_____

_____

_____

Room No.

_____

Reported by: _____

Date Reported: _____Date Repaired:_____ Repaired By:_____

Copy To: _____Lab Supervisor; _____Lab Manager; _____Chemical Hygiene Officer

_____

The **Instrument Maintenance Request Form** is reproduced on peach colored card stock and is available at the Stockroom window.

Attachment 6

INJURY, ACCIDENT, OR INCIDENT REPORT FORM

The UWEC Chemistry Department requires that an **Injury, Accident, or Incident Form** be filled out for the following:

1. Personal injuries, such as those incurred because of cuts, burns, electric shock, etc.
2. Unplanned fires.
3. All mercury spills.
4. Strong acid and base spills exceeding approximately 100 mL.
5. All major spills of toxic chemicals.
6. Gas leaks or unplanned discharges of a gas.
7. Water spillage exceeding approximately 10 Liters.

UWEC CHEMISTRY DEPARTMENT
INJURY, ACCIDENT, OR INCIDENT REPORT FORM

Student, Faculty or Staff Name :____

Supervisor's Signature: ____

Date of Incident: ____________ Time of Incident:__________Course No.:________ Sec. No.:______

Room No.: _____________ Experiment:____

Type of Injury: ____

How Injury Was Obtained:____

Treatment: ____

What Follow-up Is Required? ____

RETURN THIS COMPLETED FORM TO: THE CHEMISTRY DEPARTMENT CHEMICAL HYGIENE OFFICER.

- -

The **Injury, Accident, or Incident Report Form** is reproduced on red card stock and is available at the Stockroom window.

Attachment 7
TRAINING DOCUMENTATION FORM FOR LABORATORY COURSES

This statement is to serve as a confirmation or verification that the student has received instruction in the basic principles of laboratory safety including:

1. Laboratory regulations to be followed in Chemistry laboratories at the University of Wisconsin-Eau Claire.
2. Safety procedures and precautions to be followed in the Chemistry laboratory.
3. Fundamental instructions concerning the properties, use, and disposal of chemicals.
4. Emergency procedures to be followed in case of injury or exposure to laboratory hazards.
5. Verbal instructions on the use of the safety shower, eye wash fountain, fire blanket, fire extinguisher, fire alarms, emergency exits, body fluid disposal, first aid supplies and manual, sinks and location of emergency phone numbers and the nearest phone, Injury, Accident, or Incident, Report Forms, Safety Maintenance Request Forms, Chemical Hygiene Plan and Material Safety Data Sheets.
6. Cell phone usage in the lab is not permitted (except in an emergency situation).
7. It is recommended that you consult with the laboratory instructor if you may be pregnant.

STUDENT NAME (Please print):________________________________

STUDENT SIGNATURE ________________________________Date ____________

Lab Section ______ Course ______________ Instructor________________________

Allergies: ____

Do you plan to wear contact lenses in the laboratory? _____ Yes _____ No

RETURN ONE SIGNED COPY TO LABORATORY SUPERVISOR; RETAIN THE DUPLICATE FOR REFERENCE.

- -

STUDENT NAME (Please print):________________________________

STUDENT SIGNATURE ________________________________Date ____________

Lab Section ________ Course ______________Instructor ________________________

Allergies: ____

Do you plan to wear contact lenses in the laboratory? ______ Yes _____ No

RETURN ONE SIGNED COPY TO LABORATORY SUPERVISOR; RETAIN THE DUPLICATE FOR REFERENCE.

Attachment 8
Laser Safety Guidelines

Everyone who uses a laser should be aware of the risks. This awareness is not just a matter of time spent with lasers; to the contrary, long-term dealing with invisible risks (such as from ultraviolet laser beams) tends to reduce risk awareness, rather than to sharpen it.

Optical experiments should be carried out on an optical table with all laser beams travelling in the horizontal plane only, and all beams should be stopped at the edges of the table. Users should never put their eyes at the level of the horizontal plane where the beams are in case a reflected beam leaves the table.

Watches and other jewelry that might enter the optical plane are not allowed in the laboratory. All non-optical objects that are close to the optical plane should have a matte finish in order to prevent specular reflections.

Adequate eye protection should always be required for everyone in the room if there is a significant risk for eye injury. High-intensity beams that can cause fire or skin damage (mainly from class 4 and ultraviolet lasers) should be guided through tubes.

Alignment of beams and optical components should be performed at a reduced beam power whenever possible.

Eyewear: The use of eye protection when operating lasers of classes 3B and 4 in a manner that may result in eye exposure in excess of the maximum permissible exposure is required in the workplace by the U.S. Occupational Safety and Health Administration.

Protective eyewear in the form of spectacles or goggles with appropriately filtering optics can protect the eyes from the reflected or scattered laser light with a hazardous beam power, as well as from direct exposure to a laser beam. Eyewear must be selected for the specific type of laser, to block or attenuate in the appropriate wavelength range.

Attachment 9

Safety Data Sheet (SDS) (Revision of the old MSDS)

The format of the 16-section SDS should include the following sections:

Section 1. Identification

Section 2. Hazard(s) identification

Section 3. Composition/information on ingredients

Section 4. First-Aid measures

Section 5. Fire-fighting measures

Section 6. Accidental release measures

Section 7. Handling and storage

Section 8. Exposure controls/personal protection

Section 9. Physical and chemical properties

Section 10. Stability and reactivity

Section 11. Toxicological information

Section 12. Ecological information

Section 13. Disposal considerations

Section 14. Transport information

Section 15. Regulatory information

Section 16. Other information, including date of preparation or last revision

Sections 12-15 may be included in the SDS, but are not required by OSHA.

This is taken directly from the OSHA website
http://www.osha.gov/dsg/hazcom/hazcom-faq.html
where you can read further details.

Attachment 10

Safety vocabulary check list for students and faculty

1. Asphyxiant
2. Autoignition temperature
3. Biological hazards
4. Carcinogenic hazards
5. Compressed gas hazards (including correctly securing compressed gas cylinders)
6. Corrosive hazards
7. Cryogenic hazards
8. Electrical hazards
9. Explosive hazards
10. Fetotoxicant
11. Flammability hazards
12. Flash point
13. Global Harmonized System
14. High and low pressure system hazards
15. IDLH (Immediate danger to life or health)
16. Incompatible chemical storage
17. Lachrymator
18. Long-term exposure limit (LTEL)
19. Mutagenic hazards
20. Occupational Safety and Health Administration (OSHA)
21. Occupational exposure limit (OEL)
22. Permissible exposure limit (PEL)
23. Peroxide hazards
24. Personal protective equipment (PPE)
25. Pyrophoric material hazards
26. Radioactive and radiological hazards
27. RAMP system
28. Reactive/unstable chemical hazards
29. Risk assessment of hazards
30. Safety Data Sheet (SDS) (formerly the Material Safety Data Sheet – MSDS)
31. Sternutator
32. Teratogenic hazards
33. Ultraviolet radiation hazards

Attachment 11

Basic Terminology and Concepts

1. Understand the distinction between hazard and risk.
2. Understand the distinction between acute and chronic toxicity. Be able to provide examples of each.
3. Be able to give the general effects that corrosives have on the skin.
4. Be able to comment on the general hazards associated with common flammables.
5. Be able to assess potential flammability based on the structure and properties of a compound.
6. Interpret the statement “The dose makes the poison”.
7. Explain why reduced scale experiments reduce the risk.

Attachment 12

R A M P Concept for the design of an experiment.

Recognize the Hazards

Assess the Risks of the Hazards

Minimize the Risks of the Hazards

Prepare for Emergencies from Uncontrolled Hazards

Attachment 13

There are nine pictograms to convey the health, physical and environmental hazards. The final Hazard Communication Standard (HCS) requires eight of these pictograms, the exception being the environmental pictogram, as environmental hazards are not within OSHA's jurisdiction. The hazard pictograms and their corresponding hazards are shown below.

HCS Pictograms and Hazards

Health Hazard 	**Flame** 	**Exclamation Mark** 
• Carcinogen • Mutagenicity • Reproductive Toxicity • Respiratory Sensitizer • Target Organ Toxicity • Aspiration Toxicity	• Flammables • Pyrophorics • Self-Heating • Emits Flammable Gas • Self-Reactives • Organic Peroxides	• Irritant (skin and eye) • Skin Sensitizer • Acute Toxicity (harmful) • Narcotic Effects • Respiratory Tract Irritant • Hazardous to Ozone Layer (Non Mandatory)
Gas Cylinder 	**Corrosion** 	**Exploding Bomb** 
• Gases under Pressure	• Skin Corrosion/ burns • Eye Damage • Corrosive to Metals	• Explosives • Self-Reactives • Organic Peroxides
Flame over Circle 	**Environment (Non Mandatory)** 	**Skull and Crossbones** 
• Oxidizers	• Aquatic Toxicity	• Acute Toxicity (fatal or toxic)