

Safety Guidelines for Persons Conducting Chemical Research at the University of Evansville

Background

This document was generated by the Department of Chemistry's Safety Committee, which was itself established by the Department in response to a desire to emulate the "bright spots" and "best practices" as laid out in the *Creating Safety Cultures in Academic Institutions* report published by American Chemical Society. The purpose of this document is to serve as a reference for all members of the University community engaged in chemical research; their personal safety is of utmost importance and cannot be overstated. However important the research itself may be, it pales in comparison to the safety of the person(s) conducting it.

Responsibility for Safety

The safety of researchers in the Department of Chemistry requires a total commitment from the entire University community. Individuals conducting research must not only see to their own personal safety, but also to the safety of others in the Department by positively contributing to the establishment of a *proactive* safety culture.

- Undergraduate students must accept their role in this endeavor, and must comply with any additional safety recommendations of the faculty beyond the scope of the recommendations laid out in this document.
- Faculty mentors must ensure that their undergraduate colleagues are adhering to all prudent safety practices, and must ultimately accept responsibility for ensuring the safety of their students through proper training and provision of adequate personal protective equipment.

Prior to Beginning Work

All personnel who will be performing chemical research must complete the appropriate online training courses, which are coordinated by Jan Schrader, the University Risk and Environmental Management officer. She can be contacted at 812-488-2697 or js652@evansville.edu. Courses may be tailored to the nature of the work to be performed, but *at the minimum* shall consist of:

- Proper chemical / waste management, storage, and handling
- Fire safety

Additionally, the Department of Chemistry's safety website (address to be inserted here, once it's published) must be thoroughly consulted. The appropriate volume of the *Safety in Academic Chemistry Laboratories: Accident Prevention for... ..College and University Students* (Volume 1) or *...Faculty and Administrators* (Volume 2), available via its corresponding link on the website, must be read. Likewise, the University of Evansville Chemical Hygiene Plan must also be read; a form asserting that these documents have been read must be signed and placed on file with the Department Safety Committee.

Beginning Work

The safe way to work is the *only* way to work. Work *should not* be performed in isolation or when other workers are not present nearby (as may happen in the evenings or on weekends). Workers should establish and adhere to regular schedules which maximize the time when a quorum is reached and others are present to watch out for and check in on each other on a regular basis.

Awareness of safety requires careful forethought and planning of the procedures to be performed, with attention specifically paid to the potential hazards associated with the particular reagents and solvents to be used, their manipulation and handling, as well as any hazards which may be specific to the procedure and/or may develop as a result of the reaction being conducted. The first and foremost rule of thumb is to treat *all* reagents with respect, and especially when using a reagent or performing a procedure for the first time, to assume that this is a “high risk” operation. Thus, the following sources of information should be consulted:

- Safety Data Sheets (SDS) for the reagents used.
- The faculty Principal Investigator overseeing the project.
- A Standard Operating Procedure (SOP) for the particular reagent employed or steps to be followed. (See the section below on SOPs)

A written comment in the laboratory notebook or record for the procedure should note particular hazards, as well as steps necessary to mitigate these. While subsequent repetition of the same procedure may inevitably lead to a degree of complacency, adherence to proper safety protocols *must* become part of the “routine.”

A second rule of thumb is to assume that *any change made to a common or “known” procedure necessarily converts it to a “high risk” procedure* again. Such a change may include, but is not limited to: 1)- “scaling up” or 2)- changing the heat source, reaction temperature, reagent, or solvent.

Standard Operating Procedures (SOPs)

It is the responsibility of each faculty member to ensure that basic guidelines for both common and uncommon procedures to be performed under his or her oversight, in the form of one or more “SOPs” for each, are on file. The Department Safety Website will serve as a repository for these procedures, as well as have a form to complete a new SOP each time the need arises. These procedures may be *developed by* the faculty member or the student, or they may be *adapted from* other sources and modified as necessary. The SOP should outline *both* the known hazards associated with the reagent to be used or the manipulation to be performed, as well as the steps to mitigate these hazards. Each SOP should be signed by each worker who performs the task, indicating that they have read the procedure, are aware of the potential hazards, and have agreed to comply with its guidelines.

Reporting of Incidents and “Near Misses”

It is the responsibility of every worker to file a report when an incident wherein any injury is sustained, no matter how minor, occurs.

Even if a bodily injury does *not* occur, any time a *potentially* hazardous situation develops, such as:

- a fire occurs (even if it is contained);
- an explosion occurs (even if nothing gets broken as a result);
- a pressure build-up leading to violent off-gassing or venting occurs;

such a “near miss” should be reported. The Department Safety Website will again host a form which will provide a place for these types of incidents to be reported. The form will require a brief description of both the incident itself, insights into the *cause* of the incident (if known), as well as potential steps to avoid such a situation in the future. The website will thus serve as a repository for the shared wisdom so obtained.

References and Other Resources to Consult for Safety Information

(to be filled in)