Safety Practices in the Gladysz Group

Mission Statement

The minute someone joins the Gladysz research group, they will begin to be exposed to our safety culture. It is critical that every new person, even those who may be visiting for only a few weeks, receive a strong impression that safety is something all existing group members take seriously, from the "boss" on down. A concern for safety must be evident in the way we conduct our own research, the way we train others to conduct their research, and the way we describe our research.

Main Principles

1. Joining the research group (including guest affiliations) requires the completion of department and research group safety training. For an outline of the latter, see "check-in and training schedule for new group members", and the specific responsibilities of the Lab Manager and the Research Director.
2. The "ground zero" for the safety culture of an individual researcher is the laboratory notebook (expectations described separately).
3. All reactions conducted on more than 5 g scales must be first vetted (ideal but perhaps less practical: group meeting; second option, advisor; third option; standing or ad-hoc safety committee consisting of at least three group members).
4. All reactions conducted on more than 0.005 g scales involving perchlorate salts and sodium azide must first be vetted (this list is expected to grow).
5. Laboratory notebooks are to be presented for checking at every researcher/advisor meeting. The primary concern is the completeness of the description of every experiment, and specifically notes regarding safety issues (hazardous starting materials or products or byproducts; dangers intrinsic to conditions or apparatus (e.g., 450 W lamps), etc.). However, the laboratory notebooks will also be used to assess productivity (recognizing that research can involve analyses and tasks not directly reflected in a laboratory notebook).
6. Note cards are to be affixed to hoods describing all reactions being run on larger scales than a 5 mm NMR tube (level of detail similar to laboratory notebook).
7. An important part of the safety culture of this research group is a clean and well organized bench area.

Details

1. Joining the group
    - 1.1. Complete the departmental safety training.
    - 1.2. Complete the group check-in check-list (lab manager, research director, training on group instruments by individuals assigned on duty list).
    - 1.3. Group meeting attendance is absolutely required.
    - 1.4. The introductory group meeting by every group member should include a description of safety procedures in effect at prior research locations (can also be separate meeting)
        - 1.4.1. group procedures at prior location
        - 1.4.2. departmental and institutional procedures at prior location

2. Collective group activities
    - 2.1. annual group cleanup/inspection
        - 2.1.1. special attention to chemical inventory (goal: improved inventory software)
        - 2.1.2. special attention to safety facilities (showers, eyewash stations, etc.)
    - 2.2. annual safety review, carried out during group meetings
        - 2.2.1. review and update group handouts dealing with safety
            - 2.2.1.1. group instrumentation, highlighting safety aspects
            - 2.2.1.2. other handouts, such as waste/ordering chemicals/first aid kits
            - 2.2.1.3. new handouts, perhaps do/don't lists (clothing, behavior)
            - 2.2.1.4. critique this outline

2.2.2. online search regarding procedures at other academic institutions
2.2.3. online search regarding procedures at industrial institutions
2.2.4. online and local search regarding procedures in other groups
2.2.5. online search for new safety monographs, literature, etc.

2.3. monthly literature seminar should have 25-33% safety content
2.3.1. dedicated safety presentations (safety education)
2.3.2. internal incident reports (can be part of any group meeting)
2.3.2.1. problem with coworker conducted reaction ("near miss" or "hit")
2.3.2.1. problem general to the entire lab (stills, chemicals in food fridge)
2.3.3. external incident reports
2.3.3.1. for example, a description of an accident described in C&EN
2.3.3.2. other "show and tell"

3. Individual researcher activity

3.1. a lab book entry is completed in advance of any experiment (set up portion)
3.2. the lab book must follow one of the accepted templates (separate handout), or the researcher must add a new template to the handout (subject to group approval)
3.3. evidence that advance laboratory book entry has included all relevant safety research
3.3.1. hazards of reactants or products or byproducts or solvents
3.3.1.1. toxicity claims are best accompanied by literature citations
3.3.1.2. see note below about data for problematic solvents
3.3.2. hazards during or in scaling reaction (exotherm, *n*BuLi+H_2O cold bath etc.)
3.4. inspection procedure for lab books
3.4.1. daily "witness" signature strongly recommended (per practices in industry on patents)
3.4.2. present to research advisor at start of every (weekly) research discussion.
3.5. appropriate protective eyeglasses and clothing are to be worn at all times.

4. Ongoing Projects; Miscellaneous

4.1. to facilitate lab book entries, compile a list of safety data/literature citations for the following problematic solvents: HMPA, benzene, CCl_4, with others to be added.
4.2. continue external research on integrated chemical inventory/safety packages
4.3. consider appointment of group safety officer (who would possibly take minutes, etc.)
4.4. industrial outreach (Dow Lab Safety Academy, http://safety.dow.com/en)