

## General Safety Regulations in a Lab

Most accidents and/or near-misses occur because of the following main reasons:

- ☒ **Not following standard safety procedures** (taking short-cuts)
- ☒ **Underestimating the dangers associated with chemical reactions** (over confident)
- ☒ **Distractions** (conversations, tiredness, multitasking)

Working in a chemical laboratory requires caution and meticulousness in performance. Familiarize yourself with the lab. Know the location of the safety showers and eyewash stations, fire extinguishers, first aid kit, the chemical spillage kit and the emergency exit routes of the lab and/or building. Most accidents are preventable if safety rules are followed, therefore, act in accordance with the safety instructions.

- **Maintain clean hands.** Sterilization and/or hand washing, preferably with antiseptic chemicals, including alcohol and chlorhexidine or water and soap accompanied by drying using one-time paper towels or the use of modern hand drying machinery.
  - Hand washing or sterilization will be performed following lab work of any kind, including all contact with chemical substances or biological contaminants, before and after going into and out of the toilet and prior to eating and/or drinking and/or putting on makeup and/or smoking (where it is allowed).
- The laboratory should be kept neat, clean and free of materials that are not pertinent to the work. All items that do not belong in the lab and pose additional hazard should be removed or stored properly.
- **Eating, drinking, chewing gum, putting on makeup and smoking in the laboratory are strictly prohibited.** Eating or entering eating areas with a laboratory coat on is strictly forbidden.
- At the moment the safety unit does not enable working alone in the lab. Make sure that there are at least two people in the lab or someone located next door coupled to notifying security regarding your exact whereabouts (building's name, floor and room number/s). Safelet will soon be introduced by the Safety Unit enabling working alone in the lab. However, **hydrogenations, the use of pyrophorics, corrosives or reactions involving potentially explosive reagents (e.g. iodosobenzene) necessitate are not allowed to be performed outside regular working schedules.**
- If you need to work overnight, contact your supervisor to formulate a work plan. The safety unit may also assist in providing the proper working environment to allow you to work alone. Check before commencing work that your **hood** is in good working condition, i.e.: not cluttered with reaction flasks, chemicals and solvent bottles. Ongoing reactions should be labeled and chemical waste bottles should be closed.
- **Laboratory refrigerators are off-limits.** It is strictly forbidden to store food and beverages in laboratory refrigerators.

- **Centrifuges** pose a grave risk if they rotate at high speed and are not sealed, therefore they must be equipped with a locking apparatus preventing both operating open centrifuges as well as opening the centrifuge's lid while rotating.
- All synthesized chemicals, reactions flasks, solvent pots, etc. should be **clearly labeled**.
- Assume that **all** newly synthesized **chemicals are toxic** and handle them as such. Read MSDS.
  - **It is prohibited to taste or sniff a chemical substance.** If you are required to smell chemical vapors, you must keep the vessel in which the chemical is in away from your nose and wave your hand over the opening so that the substance's vapors will reach your nose in a controlled manner.
- **Do not put a pipette into your mouth.** Using your mouth is a hazard that can cause a toxic substance to be inhaled. Use only a pump aid, such as a syringe, propipette or "Jackie" for this purpose.
- **After removing the substance**, take care to **immediately close** the **container** from which it was originally taken out of to prevent contamination of the bulk substance, entry or emission of water vapors, emission of volatile substances into the environment or confusion between lids.
- **Do not return a chemical substance to a container.** In case unused chemical substances are left, it is strictly prohibited to return it to the container from which it was originally pumped out of (bottle, box, flask, container). Returning a substance to the container may contaminate the original bulk substance in the container or cause an unwanted chemical reaction in other cases.
- All experimental residual substances must be classified as **chemical waste**.
  - Treat the chemical waste in accordance with the specific substance's handling instructions.
  - Do not pour substances from different classes into the same chemical waste storage container.
  - Do not dispose of any hazardous chemicals through the sewer system. These substances might interfere with the biological activity of waste water treatment plants, create fire or explosion hazards, cause structural damage or obstruct flow.
- Research staff and students should **never work alone** on procedures involving hazardous chemicals, pathogens or physical hazards.
- A designated **eye washer** and **emergency showers** operated by a hand chain are installed in every chemical lab. In case of a splash, rinse body part using an excessive amount of water onto body part, clothing or bench, which came in contact with the chemical.
- **Beware of broken glass.** Glass is a hard-breakable material that can be lethal. - When adjusting a glass pipe or thermometer into a stopper, a rubber hose or a cork, use grease and protect your hands with a cloth.
  - Trying to release a cork stuck in a glass vessel could be dangerous. Apply controlled heat or incubation in appropriate solvents by qualified personnel.
  - Do not use a cracked or broken glass vessel.
  - If you break a vessel or encounter a broken vessel, give it to a technician and obtain another one.

- Broken glassware or any glass waste should always be evacuated into designated sharps bins. Broken glassware, which are thrown into ordinary trash bins, could injure cleaning employees.
- Always protect your eyes when working with glass.
- Glassware should always be marked, stating their contents.
- For procedures which include freezing or freezing and thawing cycles due to thermic expansion work with designated glassware with thick walls. Pay extra attention not to work with cracked glassware.
- Hot glass looks identical to cold glass.
- Glassware could explode if exhaust pipes are blocked.
- Glassware could collapse under negative pressure conditions.
- When pumping compressed air into a glass vessel in order to dry the vessel, following its washing, the vessel could break. It is therefore recommended to allow glassware to dry on a designated drying apparatus or in an oven.