

Radiation Safety Newsletter

I know most of you are getting ready for the holidays and finals, so I thought I would make a very short newsletter to stress two important safety issues: Labels and PPE (personal protective equipment)

Labels

It is important that all containers in your lab have a label that describes their contents. There was a report just the other day about a reaction



and explosion with injuries at Kentucky as a person was pouring acid waste into a waste container. Even containers of water and soap should be labeled to insure that there is no confusion.

Contents of all chemical containers, including beakers, flasks, reactions vessels, and process equipment, etc., should be properly identified. The goal of labeling containers is to assist in maintaining an accurate chemical inventory and to avoid orphaned containers of unknown materials that may be expensive or dangerous to dispose. Labels should be understandable to all laboratory workers and be resistant to fading from aging, chemical exposure, temperature, etc.

Labels on secondary chemical containers used to store chemicals should include the name of the responsible party, chemical identification and appropriate warnings.

EPA rules require that all waste containers be labeled with the material's identity and its hazard (e.g., flammable, corrosive, etc.). The label should have sufficient information to enable all laboratory workers to evaluate the hazard. When compatible wastes are collected in a common container, it is advisable to keep a list of the components to aid in later disposal decisions.

For radioactive materials, labels should include the radiation symbol, the radioisotope, the activity and date. For very small containers (e.g., centrifuge tubes), labeling the racks may be easier. While there are lower limits below which radioactive labeling is not required, it is prudent to warn others of the potential hazard by using radioactive labels or radiation symbol.

Personal Protective Equipment (PPE)

The purpose of PPE is to protect the wearer from acute exposures (e.g., acid spills / splashes) and reduce the risk of contamination and its subsequent entry into the body. Thus, PPE consists of items like appropriate protective gloves, protective clothing and protective eyewear.

Protective gloves. Not all gloves are created equal. Vinyl and latex gloves are inexpensive, comfortable and provide a nominal barrier to common hazards. However, vinyl and latex gloves offer no protection from many corrosive or organic solvents. To choose the right glove for your potential exposure you need to use a glove chemical resistant chart. Most vendors will have a chart which lists glove types and their chemical resistance. You should select a glove that is "excellent" or "good" for the chemical you are using. Consider wearing two pair of appropriate gloves if the situation warrants.

Remember that all gloves can be permeated by chemicals to some degree. They are not meant to provide protection from prolonged immersion in chemicals.



Never reach into any liquids with a gloved hand, for example, use tongs to retrieve items from the bottom of your acid bath. Otherwise, someday your hand could go in deeper than the cuff or the glove could fail.

For reusable gloves, don't forget to wash or at least rinse off the gloves after use. This will prolong their useful life and prevent the spread of chemical contamination from the dirty gloves. If you didn't remove the gloves immediately after use, wash them as you would your hands before touching anything like faucet handles or telephones.

Lastly, if you have to wear gloves outside the lab because you are moving a sample to another room, the best method is to use a cart. Place your sample on a cart, then remove your protective gloves and wash your hands. Put on a clean pair of gloves and move the sample. This will prevent spills and cross contamination.

Protective eyewear. Eye injuries are horrifying, but preventable events. No one should enter a laboratory without proper eye protection. Protective eyewear is the minimum requirement for laboratory eye protection. Wear enclosed goggles or a face shield over your safety glasses if there is a danger of splashed liquids or shattering glass. If you work with ultraviolet or laser light, wear protective lenses specific for the wavelength. Safety equipment vendors have a large assortment of eye protection. Newer models are nearly fog proof, comfortable to wear, come in a great variety of sizes and styles and are quite fashionable. There is no excuse for not wearing eye protection in a laboratory.



Should you wear contact lenses in laboratories? While there are urban legends regarding hazards of contact lenses in labs, OSHA believes that contact lenses do not pose additional hazards and can be worn with acceptable (i.e., ANSI Z87.1-2003) protective eyewear. OSHA guidance also states, "Avoid use of contact lenses in the laboratory unless necessary; if they are used, inform supervisor so special precautions can be taken." That being said, be aware of the risks of wearing contact lenses. They are difficult to remove if your eyes must be washed in an emergency. Also, they can trap contaminants against your eye and they restrict the flow of natural fluids that remove minor eye contaminants. A better alternative for laboratory work is to wear prescription safety glasses or specially designed goggles.

Protective clothing. Wear clothing that protects your skin. Shoes should completely cover your feet; sandals are risky because they don't protect against spills or broken glass. To protect your legs, wear long pants instead of shorts or skirts. Use a lab coat for further protection. The coat sleeves keep splashes, aerosols and dusts from touching your arms. Have a plastic or rubber apron available for working with strong caustics or corrosives.

Cryogenic Liquids. Workers must be thoroughly familiar with the properties and safety considerations before handling cryogenic liquids. The eyes are one of the most sensitive body parts to the extreme cold of the liquid and vapors of cryogenic liquids. The recommended PPE for handling cryogenics includes a full face shield over safety glasses, loose-fitting thermal insulated or leather gloves, long sleeve shirts, and trousers without cuffs. Gloves should be loose-fitting so they are able to be quickly removed if cryogenic liquid is spilled on them. Insulated gloves are not made to permit the hands to be put into a cryogenic liquid. They will only provide short-term protection from accidental contact with the liquid.

Again, as the semester winds to a close and you prepare to celebrate the holidays, enjoy yourself and take care.