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## STANDARD OPERATING PROCEDURES (Personal Protection and Laboratory Protocol)

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The following are general guidelines for all laboratory workers:

- Follow all safety instructions carefully.
- Become thoroughly acquainted with the location and use of safety facilities such as safety showers, exits and eyewash fountains.
- Before undertaking any laboratory work:
  - Become familiar with the hazards of the chemicals involved. Know the safety precautions and emergency procedures that protect you from those hazards.
  - Become familiar with the hazards of the apparatus and of the operations involved. Know what to do to protect yourself and others from those hazards.

### *Eye Protection*

All persons in the laboratory including visitors must wear safety goggles (not safety glasses or spectacles) at all times, even when not performing a chemical operation.

Wearing contact lenses in the laboratory is normally forbidden because contact lenses can hold foreign materials against the cornea. Furthermore, they can be difficult to remove in case of a splash. Soft contact lenses present a particular hazard because they can absorb and retain chemical vapors.

### *Clothing*

Clothing worn in the laboratory should offer protection from splashes and spills; it should be easily removable in case of accident and should be at least fire resistant. Nonflammable, nonporous aprons offer the most satisfactory and the least expensive protection. If worn instead of an apron, lab jackets or coats should have snap fasteners rather than buttons so that they can be readily removed.

### *Gloves*

Gloves serve as an important part of personal protection, but they must be used correctly. Check to ensure the absence of cracks or small holes in the gloves before each use. In order to prevent the unintentional spread of chemicals, gloves should be removed before leaving the work area and before handling such things as telephones, doorknobs, writing instruments, and laboratory notebooks. Gloves may be reused, cleaned, or discarded, consistent with their use and contamination.

### *Personal Hygiene*

- Do not prepare, store or consume food or beverages in any chemical laboratory.
- Do not smoke in any chemical laboratory. Be aware that tobacco products in open packages can absorb chemical vapors.
- Do not apply cosmetics when in the laboratory
- Wash hands and arms thoroughly before leaving the laboratory, even if gloves have been worn.
- Wash lab coats or jackets on which chemicals have been spilled separately from personal laundry.
- Never wear or bring lab coats or jackets into areas where food is consumed.
- Never pipet by mouth. Always use a pipet aid or suction bulb.

### *Cleaning Glassware*

Clean glassware at the laboratory sink or in laboratory dishwashers. Use hot water, if available and soap or other detergent. If necessary, use a mild scouring powder. Wear appropriate gloves that have been checked to ensure that no holes are present. Use brushes of suitable stiffness and size. Avoid accumulating too many articles in the cleanup area. Usually, work space around a sink is limited; piling up dirty or cleaned glassware can lead to breakage. Remember that the turbid water in a sink may hide a jagged edge on a piece of broken glassware that was intact when put into the water. Drain out the standing water. Then use a pair of heavy gloves to remove broken glass.

Avoid use of strong cleaning agents such as nitric acid, chromic acid, sulfuric acid or other strong oxidizers unless specifically instructed to use them.

### *Transporting Chemicals*

Transport all chemicals using the container-within-a-container concept. This will shield them from shock during any sudden change of movement.

When moving in the laboratory, anticipate sudden backing up or changes in direction by others. If you should stumble or fall while carrying glassware or chemicals, try to project them away from yourself and others.

### *Fume Hoods and Ventilation*

A large number of common substances present acute respiratory hazards and should not be used in a confined area. They should be dispensed and handled where there is adequate ventilation, such as in a hood. Adequate ventilation is defined as ventilation that is sufficient to keep the concentration of a chemical below the threshold limit value (TLV) or permissible exposure limit (PEL).

### *Refrigerators*

Chemicals stored in refrigerators should be sealed, double packaged if possible, and labeled with the name of the material, the date placed in the refrigerator, and the name of the person who stored the material. All chemicals should be disposed of after a specified storage period.

If used for storage of radioactive materials, a refrigerator should be plainly marked with the standard radioactivity symbol and lettering, and routine surveys should be made to ensure that the radioactive material has not contaminated the refrigerator.

Food should NEVER be stored in a refrigerator used for chemical storage.

*Incompatible Chemicals*

Chemical	Incompatible with...
Acetone	Concentrated nitric and sulfuric acid mixtures
Hydrofluoric acid (HF)	Ammonia (aqueous or anhydrous)
Nitric Acid	Acetic acid, aniline, chromic acid, hydrocyanic acid, hydrogen sulfide, flammable liquids and gases, copper, brass, any heavy metals.
Sulfuric acid	Potassium chlorate, potassium perchlorate, potassium permanganate (similar compounds of light metals, such sodium, lithium)