

GENERAL LABORATORY SAFETY TRAINING

Lec : 1

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Organic Ch. Lab.

STAYING SAFE MEANS THAT YOU...

- Read labels on containers of chemicals
- Read Material Safety Data Sheets (MSDS)
- Handle chemicals with care
- Use correct protective clothing and equipment
- Remember emergency procedures

CHEMICAL LABELS

- Every container of chemicals is labeled by the manufacturer.
- The **label** will tell you
 - **Name** of chemical
 - Name, address and emergency phone number of **manufacturer**
 - Physical and health **hazards**
 - **Precautionary** measures
 - **First-aid** instructions
 - Proper **handling/storage** instructions



HEALTH HAZARDS ON A CHEMICAL LABEL

- Carcinogen
- Highly toxic agent
- Toxic agent
- Reproductive hazard
- Irritant
- Corrosive
- Sensitizer
- Hepatotoxin
- Nephrotoxin
- Neurotoxin

TYPICAL PRECAUTIONARY MEASURES ON A LABEL

- Do **not breathe** vapors
- Use in **well-ventilated** areas
- Keep container **closed** when not in use
- Avoid contact with **skin**
- **Wash** thoroughly with soap and water **after** handling
- **Keep away** from sparks, heat, and flame
- **Do not store** near **combustible** materials
- Store in **tightly closed** container
- Remove and wash contaminated **clothing** promptly
- **Keep from** contact with clothing and other combustible materials

COMMON SIGNAL WORDS ON LABELS

- **Danger** – Can cause immediate serious injury or death
- **Warning** – Can cause potentially serious injury or death
- **Caution** – Can cause potentially moderate injury

SPECIAL SYMBOLS USED ON LABELS

Helps you recognize kind of hazard a chemical could present if you are not careful

- **Toxicity**
- **Corrosivity** (acids and bases)
- **Ignitability** (flammable solvents and certain solids)
- **Reactivity** (sodium and various water-reactive reagents)

COLOR AND NUMBER CODED LABEL SYSTEMS

NFPA-type label



Colors represent kind of hazard

- Red = fire
- Yellow = instability
- Blue = health
- black = specific hazard & personal protection

Numbers show degree of hazard

- 0 = Minimal
- 1 = Slight
- 2 = Moderate
- 3 = Serious
- 4 = Severe

COLOR AND NUMBER CODED LABEL SYSTEMS

NFPA-type labels



Black = specific hazard

- **OX** = Oxidizer
- **ACID** = Acid
- **ALK** = Alkali
- **COR** = Corrosive
- ~~**W**~~ = Use no water
- Other symbols:



Material Safety Data Sheets (MSDS)

Provides more **detailed information** about a chemical, including

- **Composition**, information on ingredients
- **Hazards** identification
- **First aid** measures
- **Accidental Release** measures
- **Handling** and **Storage**
- Exposure controls, **personal protection**
- **Stability** and **reactivity**
- **Toxicological** information

CHEMICAL STORAGE

- Labs have established separate storage areas for
 - ✓ Flammable and combustible organic liquids and solvents
 - ✓ Acids
 - ✓ Dry poisons, salts, and oxidizers
 - ✓ Bases

- Chemicals are stored in
 - ✓ Chemical storage cabinets
 - ✓ Flammable storage refrigerators (No food)
 - ✓ Chemical storage refrigerators/freezers (No food)
 - ✓ On shelves with retaining barriers

STORAGE FUNDAMENTALS

- Identify incompatible chemicals – check the Material Safety Data Sheet
- Isolate and separate incompatible materials
 - Isolate by storing in another area or room
 - Degree of isolation depends on quantities, chemical properties and packaging
 - Separate by storing in same area or room, but apart from each other

USE CORRECT PROTECTIVE CLOTHING AND EQUIPMENT

○ Eye Protection

- ✓ Safety glasses – flying particles, chemical splashes, dust
- ✓ Splash goggles – corrosive liquids, solvents, powders
- ✓ Face Shields – high pressure systems

○ Respiratory Protection – normally not needed at LUC

○ Skin and Body Protection

- ✓ Gloves – see the MSDS
- ✓ Aprons and lab coats – strong acids and bases
- ✓ Shoes – always worn in lab, closed toe and closed heel

○ Hearing Protection – normally not needed at LUC



Do not

- **Use** damaged glassware
- **Store chemicals** near heat, sunlight, or other substances with which they might react
- **Store materials** on floors or other places where people could trip over them
- **Leave** equipment unattended when its operating (unless it is designed to do so or you have an SOP)
- **Put** custodians and fellow workers in danger

