



## **Clinical Chemistry**

# **Fire Safety and control of other hazards**



## **FIRE SAFETY**

### **A. FLAMMABLES AND COMBUSTIBLES**

1. University guidelines are to be followed regarding possession limits for flammable and combustible materials located outside of approved storage cabinets.  
(See Appendix 6.)
2. Flammable liquids that must be refrigerated should be stored only in laboratory safe or explosion proof refrigerators and/or cold rooms.
3. Volatile liquids are to be stored away from sources of heat or electrical spark and sunlight.
4. Flammable or combustible materials may only be heated using appropriate laboratory appliances.
5. Open flame devices are not to be utilized in areas where flammable or combustible liquids or gases are in use.

## **COMPRESSED GASES/CRYOGENS**

### **A. COMPRESSED GASES (See Compressed Gas Cylinder Safety Manual)**

1. The contents of all gas cylinders must be legibly identified.
2. Fuel gases and oxygen cylinders must be stored separated.
3. All gas cylinders should be secured against falling by the use of appropriate clamps and/or brackets.



4. Cylinders, when not in use, must always be shut off at the main valve stem and not through the use of regulators.
5. Appropriate regulators are to be used to control gas flow from cylinders.
6. Valve protection caps should be in place when cylinders are not in use and also during transport.
7. Empty and full gas cylinders should be stored in separate storage areas.

## **B. CRYOGENS**

1. Cryogenics (liquified gases or dry ice) are to be used only in well ventilated areas.
2. Cryogenic fluids should be used and transported in appropriate containers.
3. Personnel should not accompany an asphyxiant in an elevator.
4. Tygon tubing must not be used for conveying cryogenics.

## **EQUIPMENT**

- A. Indicator lights on all equipment must be in working order.
- B. Operation manuals for all laboratory equipment must be provided if available.



- C. Protective guards are to be provided for machinery moving parts.
- D. Hoses and tubing must be free of cracks and abrasions.
- E. Electrical cords must be free of breaks, exposed wires, or poor insulation.
- F. Electrical equipment should not be operated in areas containing explosive vapors.
- G. Refrigerators are to be clearly labeled as either laboratory safe, explosion proof, or nonexplosion proof.
- H. All electrical outlets and equipment must be grounded. Ground fault interrupters should be installed in all outlets within 6 feet of a water source.
- I. Overloading of circuits is prohibited.
- J. Electrical panels are to be identified and to be accessible.

## **WASTE DISPOSAL**

- A. All laboratory personnel should be familiar with the UTD waste disposal procedures for chemicals (Waste Disposal Manual).



- 
- B. All waste containers must be properly segregated and clearly marked regarding contents, hazards, and other pertinent information.
- C. Waste materials are not allowed to accumulate excessively in the laboratory and in no case longer than 180 days. The date accumulation began should be marked on the container.
- D. Needles and broken glassware are to be segregated in appropriately labeled containers away from other waste (see section Waste Disposal Manual, VII, C).
- E. Chemicals are prohibited from being disposed of through the sanitary sewer system.
- F. Liquid and solid organic waste must be segregated.
- G. Inorganic liquid waste should be segregated from other waste.
- H. Chlorinated solvent waste should be segregated from nonchlorinated solvent waste.
- I. Chemicals that have become hazardous or unstable because of age are to be disposed of properly (see Waste Disposal Manual).

## **PERSONAL PROTECTION AND EMERGENCY EQUIPMENT**



- A. Personal protective equipment is to be made available for all laboratory personnel including appropriate eye and face protection, hand protection, foot protection, body protection and respiratory protection.
- B. Laboratory personnel are required to wear body, hand, and eye and face protection for all laboratory procedures involving hazardous materials.
- C. Water tap eye wash stations are to be made available in working order.
- D. Squeeze bottle type eye wash stations are prohibited in the laboratory.
- E. Safety showers and eye wash stations are to be accessible to all laboratory personnel.
- F. Spill control kits or suitable absorbents must be in each lab.
- G. The UTD emergency phone number label and sign should be posted in the laboratory.
- H. A first aid kit is to be available in each lab.
- I. At least one member of the laboratory must have completed first aid training.

#### HAZARDOUS MATERIALS DEFINITION

A —hazardous material is defined as any material or substance which by its inherent properties or if improperly handled can be damaging to health or the environment.\*

Such materials cover a broad range of types which may be classified as follows:



1. Poisons or toxic agents including drugs, chemicals, and natural or synthetic products that are in any way harmful, ranging from those that cause death to skin irritants and allergens, and also including genotoxic substances causing cancer, mutations, and/or birth defects.
  
2. Biological materials including all laboratory specimens or materials consisting of, containing, or contaminated with blood, plasma, serum, urine, feces, or other human or animal tissues or fluids, as well as inoculated media, cultures, and other potentially infectious materials such as bacteria, fungi, viruses, parasites, spores, etc., that must be either sterilized by autoclaving before disposal or must be incinerated.
  
3. Corrosive chemicals, such as sodium hydroxide or sulfuric acid, that burn or otherwise damage the skin and mucous membranes on external contact or through inhalation.
  
4. Flammable materials including (a) organic solvents, (b) finely divided metals or powders (e.g., magnesium or sodium), and (c) chemicals that either evolve or absorb oxygen during storage, thus constituting a fire risk in contact with organic materials.
  
5. Explosives and strong oxidizing agents such as peroxides and nitrates.
  
6. Materials in which dangerous heat buildup occurs on storage, either by oxidation or microbiological action (e.g., organic waste materials).



## Pathological Analysis Department

**Title of the lecture: FIRE SAFETY and control of other hazards**

**Msc . Tholfikar Ahmed**

**Tholfikar-Ahmed @mustaqbal-college.edu.iq**

---

