Topics Covered

- Regulatory Standards
- Chemical Storage
- Lab Inspections
Regulatory Standard
Federal and Local Standard

- Federal
  - OSHA
  - EPA
- State
  - NYSDEC
- City
  - FDNY
29 CFR 1910.1450: Occupational Exposure to Hazardous Chemicals in Laboratories

- **Scope**: Covers all workers using hazardous chemicals in laboratories. "Laboratory use" means performing chemical procedures using small quantities of hazardous chemicals on a laboratory scale and not as part of a production process.

- **Major requirements**
  - Recordkeeping
  - Chemical Hygiene Plan
  - Training
  - Right to Know
Recordkeeping

- Recordkeeping
  - DOE Chemical Hygiene Plan
    - CHP Specific to School
    - Chemical Hygiene Officer
  - Chemical Inventory and MSDS
  - NYCFD Permit for a lab
  - Copy of NYCFD requirements - in yellow manual
    - Certificate of Fitness Training - 14
Training

Training must be provided on the following:

• Methods of detecting the presence or release of a hazardous chemical;
• Hazards (both physical and health) of chemicals in the work area;
• Measures that workers and their employers can take to protect employees from hazards, such as appropriate work practices, emergency procedures, and personal protective equipment; and
• Details of the employer's written chemical hygiene plan.
Chemical Storage
General Guidelines

- Work bench is clean and uncluttered
- No eating in the lab
- Foods are not stored in chemical use areas
- Goggles or other PPE is worn while handling chemicals
- No materials or chemicals on tops of cabinets
- Do not store near heat or in the sun - cool dry place
- Avoid storing in lab hoods
Chemical Storage

- Maintain Chemical Inventory
- Chemicals dated
- Prohibited chemicals - CS$_2$, chloroform, carcinogens, elemental mercury should be eliminated
- No open containers or deteriorated containers
- Secure storage room
- All chemicals are labeled
- Clutter
- Chemical stored above eye level
- Rusted shelves
Chemical Segregation - “Store Likes Together”

- Stored chemicals segregated into compatible groups not alphabetically

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Storage Scheme for Chemical Storerooms

- **Acid** on Shelves (Storage at two or three feet):
  - Nitric in separate poly tray
  - HCL, Sulfuric in separate tray
  - Acetic in separate tray

- **Oxidizers:**
  - H2O2
  - Permanganates
  - Chorates
  - Chloratites (including bleach)
  - Nitrates on a separate shelf

- **Bases:**
  - Ammonium
  - Potassium
  - Hydroxides
  - (Store at two or three feet)

- **Dry Chemical Fire Extinguisher**

- **Spill Materials**
  - Caustic
  - Acid
  - Solvent Kits

- **Metals**
  - Salts that are Not Oxidizers or Nitrates

- **Use Top Shelves for Non-Hazardous Chemicals and Other Materials**

- **Flammable**
  - Storage Cabinet for:
    - Solvents
    - Oils
    - Combustible liquids

- **Use Bottom Shelves for Hazardous Chemicals**

- **Door should be open Outward and Be SELF CLOSING**

- **Room should have an Eye-Wash and Safety Shower outside door**

- **Phone outside room with emergency numbers**
**Color Coding**

**RED** - Flammable and combustible. Store separate from other chemicals.

**YELLOW** - Oxidizer. Store away from flammables.

**BLUE** - Health Hazard - Toxic. Store in secure area.
Flammable and Combustible Materials

- Minimal quantities of flammable liquids (15 gallons)
- Stored in flammable storage cabinet located in storeroom
- Segregated from oxidizers, acids, bases
- In ventilated area
- Cabinet not located in egress path or by exit door or in basements
Oxidizers

- Away from strong reducing agents - nitrites, ammonium salts
- Away from flammable and combustible
- Away from acids and bases
Acids

- Keep away from bases, combustible materials, nitrates, chlorates, other oxidizers, and finely divided metals
- Store Nitric acid away from all other acids
- Keep acetic acid away from other acids
- Do not store on metal shelves use polyethylene pans
• Red with Yellow
• Nitric acid stored with other acids
• Keep acetic acid away from other acids
Bases

- Bases in a separate area of the store room
- Bases away from acids, flammables, organic halogens and metals
- Storage of bases on soap stone shelves OK
Water reactive metals

- Stored under kerosene/Na Mineral oil/lithium
- Stored in fire resistant room in air tight metal rust free container, in secure cabinet on a shelf off the floor, not in basement
- Stored away from and plumbing pipes
- Class D fire extinguisher Na-X. or Lith-X
- Sign indicating “water reactive”
Chemical containers in poor condition from corrosion and crystal formation
Laboratory Inspections
Lab Facility

- Locations of gas and electrical cut-off are labeled
- Emergency numbers at phone
- Lights are all functional
- Floors clear, doors and drawers closed
- Housekeeping OK
- Floors are chemically resistant
- Benches are chemical resistant
- Sink available for hand washing
- General ventilation or windows that open
- Exit paths clear at all times
Eye Wash and Safety Shower

- Should meet the ANSI standard
- Eye wash should be hands free operation
- **Bottled eye wash not adequate**
- Eye wash and safety shower in prep room
- Combination drench hose and eye wash in lab at teachers desk
Fire Protection Systems

- Depends upon the age of the school
- Fire Alarms - smoke detectors
- Pull stations near exit stairs - not blocked
- Alarm system notifies the fire department or may ring only in school
- Sprinkler systems
- Must be inspected annually by DOE
Fire Extinguishers

- Mounted at 3 to 4 feet
- Sign indicating location
- Clear and accessible - travel less than 50 feet
- Fully charged
- Inspected monthly
- Annual maintenance check
Fire Extinguishers

- **Class A fires** - ordinary combustible materials - wood and paper; cools and quenches flame
- **Class B fires** - flammable liquids or grease must be extinguished by smothering the flames
- **Class C** - electrical equipment - extinguisher medium does not conduct electricity
- **Class D** - metals Copper good for Na & Li
Electrical Equipment

- GFCI are used near sinks or in wet areas
- No damaged electrical cords or equipment
- Missing cover plates
- Look out for the Emergency Gas Shut Off and Emergency Electric Shut Off
Lab Hoods

- Check with velometer - face velocity of 80-100 feet per minute
- Certificate for annual inspection
- Keep hoods clean and free of stored material, place material inside the hood
- Record of filter changes on ductless hood
Spill Containment

- Spill control pillows or booms
- Neutralizers for acids - sodium bicarbonate
- Neutralizer for bases - sodium bisulfate or citric acid
- Plastic scoops, bags, brooms, dust pans
- PPE for spill cleanup