BOSTON FIRE DEPARTMENT

STORAGE PRACTICE FOR HAZARDOUS MATERIALS

ISSUED BY
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1. ACIDS

Storage Precautions:

- Store large bottles of acids on low shelf or in acid cabinets.
- Segregate oxidizing acids from organic acids, flammable and combustible materials.
- Segregate acids from bases and active metals such as sodium, potassium, magnesium, etc.
- Segregate acids from chemicals which could generate toxic gases upon contact such as sodium cyanide, iron sulfide, etc.
- Use bottle carriers for transporting acid bottles.
- Have spill control pillows or acid neutralizers available in case of acid spills.

STRONG OXIDIZING ACIDS

Chromic Acid
Hydrobromic Acid
Iodic Acid
Nitric Acid
Perchloric Acid
Sulfuric Acid

ORGANIC ACIDS

Acetic Acid
Benzonic Acid
Chloroacetic Acid
Phenol
Propionic Acid
Sulfamic Acid
Sulfanilic Acid

ACIDS

Hydrobromous Acid
Hydrochloric Acid
Hydrobromous Acid
Hydrofluoric Acid
Hydroiodic Acid
Nitrous Acid
Phosphoric Acid
Phosphorous Acid
Sulfurous Acid
2. BASES
   **Storage Precautions:**
   - Segregate bases from acids.
   - Store solutions of inorganic hydroxides in polyethylene containers.
   - Have spill control pillows or caustic neutralizers available for caustic spills.

   **Ammonium Hydroxide**
   **Bicarbonates, salts of Potassium Bicarbonate, Sodium Bicarbonate, etc.**
   **Carbonates, Salts of Calcium Carbonate, Sodium Carbonate, etc.**
   **Calcium Hydroxide**
   **Potassium Hydroxide**
   **Sodium Hydroxide**

3. FLAMMABLES
   **Storage Precautions:**
   - Store in approved safety cans or cabinets.
   - Segregate from oxidizing acids and oxidizers.
   - Keep away any source of ignition: flames, localizes heat or sparks.
   - Have spill clean-up materials handy.
   - Store highly volatile flammable liquids in a specially equipped refrigerator.

   **SOLIDS**
   - Benzoyl Peroxide
   - Calcium Carbide
   - Phosphorus, Yellow
   - Picric Acid

   **CASES**
   - Acetylene
   - Ammonia
   - Butane
   - Carbon Monoxide
   - Ethane
   - Ethyl Chloride
   - Ethylene
   - Ethylene Oxide
   - Formaldehyde
   - Hydrogen
   - Hydrogen Sulfide
   - Methane
   - Propane
   - Propylene
LIQUIDS

Acetaldehyde
Acetone
Acetyl Chloride
Allyl Alcohol
Allyl Chloride
N-Amyl Acetate
N-Amyl Alcohol
Benzene
n-Butyl Acetate
n-Butyl Alcohol
N-Butylamine
Carbon Disulfide
Chlorobenzene
Cyclohexane
Diethylamine
Diethyl Carbonate
p-Dioxane
Ethanol
Ethyl Acetate
Ethyl Acrylate
Ethylamine
Ethyl Benzene
Ethylene Dichloride
Ethyl Ether
Ethyl Formate
Furan
Gasoline
Naptha
Hexane
Hydrazine
Isooctyl Alcohol
Isopropyl Acetate
Isopropyl Alcohol
Isopropyl Ether
Mesityl Oxide
Methanol
Methyl Acetate
Methyl Acrylate
Naphthalene
Methyl Butyl Ketone
Methyl Ethyl Ketone
Methyl Formate
Methyl Isobutyl Ketone
Methyl Methacrylate
Methyl Propyl Ketone
Morpholine
Naptha
Nitromethane
Octane
 Piperidine
Propanol
Propyl Acetate
Propylene Oxide
Pyridine
Styrene
Tetrahydrofuran
Toluene
Turpentine
Vinyl Acetate
Xylene

*Most nitrohydrocarbons are flammable.

4. OXIDIZERS

Storage Precautions:

- Store in a cool, dry place.
- Keep away from flammable and combustible materials (such as paper, wood, etc.).
- Keep away from reducing agents such as zinc, alkaline metals, and formic acid.
SOLIDS

Ammonium Dichromate
Ammonium Perchlorate
Ammonium Persulfate
Benzoyl Peroxide
Bromates, Salts of 1
Calcium Hypochlorite
Ceric Sulfate
Chlorates, Salts of 2
Chromium Trioxide
Ferric Trioxide
Ferric Chloride
Iodates, Salts of 3
Iodine
Magnesium Perchlorate
Manganese Dioxide

1. Potassium Bromate, Sodium Bromate, etc.
2. Potassium Chlorate, etc.
3. Sodium Iodate, etc.
4. Ammonium Nitrate, Ferric Nitrate, etc.
5. Lithium Peroxide, Sodium Peroxide, etc.
6. Ferric Sulfate, Potassium Sulfate, etc.

LIQUIDS

Bromine
Chromic Acid
Hydrogen Peroxide

Nitrates, Salts of 4
Periodic Acid
Permanganic Acid
Peroxides, Salts of 5
Potassium Dichromate
Potassium Ferricyanide
Potassium Permanganate
Potassium Persulfate
Sodium Bismuthate
Sodium Chlorite
Sodium Dichromate
Sodium Nitrite
Sodium Perborate
Sulfates, Salts of 6

CASES

Chlorine
Chlorine Dioxide
Fluorine
Nitrogen Dioxide

Nitric Acid
Perchloric Acid
Sulfuric Acid
Nitrogen Oxide
Oxygen
Ozone

5. WATER REACTIVE CHEMICALS

Storage Precautions:

- Store in a cool, dry place.
- In case of fire, keep water away.

WARNING: These chemicals react with water to yield flammable or toxic gases or other hazardous conditions.
SOLIDS

Aluminum Chloride, Anhydrous  Maleic Anhydride
Calcium Carbide  Phosphorus Pentachloride
Calcium Oxide  Phosphorus Pentasulfide
Ferrous Sulfide  *Potassium
*Lithium  *Sodium
Magnesium

*Lithium, Potassium and Sodium should be stored under Kerosene.

LIQUIDS

Acetyl Chloride  Stannic Chloride
Chlorosulfonic Acid  Sulfur Chloride
Phosphorus Trichloride  Sulfuryl Chloride
Silicon Tetrachloride  Thionyl Chloride

6. PYROPHORIC SUBSTANCES

Storage Precautions:

- Store in a cool, dry place.

WARNING: Pyrophoric substances ignite spontaneously upon contact with air.

Boron  *Iron
*Cadmium  *Lead
*Calcium  *Manganese
*Chromium  *Nickel
*Coalt  **Phosphorus, yellow
Diborane  *Titanium
Dichloroborane  *Zinc
2-Furaldehyde

*Finely divided metals form a pyrophoric hazard.

**Phosphorus (yellow) should be stored and cut under water.

7. LIGHT SENSITIVE CHEMICALS

Storage Precautions:

- Avoid exposure to light.
- Store in amber bottles in a cool, dry place.

Bromine  Oleic Acid
Ethyl Ether  Potassium Ferrocyanide
Ferric Ammonium Citrate  Silver Salts*
Hydrobromic Acid  Sodium Iodide
Mercuric Salts1  Mercurous Nitrate

1Mercuric chloride, mercuric iodide, etc.
2Silver acetate, silver chloride, etc.
8. PEROXIDE FORMING CHEMICALS

Storage Precautions:

- Store in airtight containers in a dark, cool and dry place.
- Label containers with receiving, opening and disposal dates.
- Dispose of peroxide forming chemicals before expected date of first peroxide formation in accordance with local regulations.
- Test for the presence of peroxides periodically.

**WARNING:** Under proper conditions, these chemicals will form explosive peroxides which can be detonated by shock or heat.

*Potassium*  
Tetrahydrofuran  
Cyclohexene  
Acetaldehyde  
*Di* *b* *i* *ox* *ane*  
Acrylaldehyde  
Ethyl Ether  
Crotonaldehyde  
Isopropyl Ether

*Potassium peroxide often exist in the crust around a chunk of Potassium. When cut with a knife the peroxide rapidly oxidizes the residual kerosene resulting in an explosion.*

9. TOXIC COMPOUNDS

Storage Precautions:

- Store according to hazardous nature of chemical, using appropriate security when necessary.
- Post emergency telephone number near telephone.

**WARNING:** These chemicals are dangerous or extremely dangerous to health and life when inhaled, swallowed or absorbed by skin contact. Take proper precautions to avoid exposure.

**SOLID**

- Antimony Compounds  
- Arsenic Compounds  
- Barium Compounds  
- Beryllium Compounds  
- Cadmium Compounds  
- Calcium Oxide  
- Chromates, salts of  
- Cyanides, salts of  
- Fluorides, salts of  
- Iodine  
- Lead Compounds  
- Mercuric Compounds

- Oxalic Acid  
- Phenol  
- Phosphorus (yellow)  
- Phosphorus Pentachloride  
- Phosphorus Pentasulfide  
- Picric Acid  
- Potassium  
- Selenium Compounds  
- Silver Nitrate  
- Sodium  
- Sodium Hydroxide  
- Sodium Hypochlorite
10. CARCINOGENS

**Storage Precautions:**

- Label all containers as Cancer Suspect Agents.
- Store according to hazardous nature of chemical, using appropriate security when necessary.

<table>
<thead>
<tr>
<th>Antimony Compounds</th>
<th>Arsenic Compounds</th>
<th>Beryllium Compounds</th>
<th>Cadmium Compounds</th>
<th>Chromates, Salts of</th>
<th>Nickel Compound</th>
<th>Vinyl Chloride</th>
<th>Acrylonitrile</th>
<th>Benzene</th>
<th>Chloroform</th>
<th>Dimethyl Sulfate</th>
<th>Dioxane</th>
<th>Ethylene Dibromide</th>
<th>Hydrazine</th>
<th>Nickel Carbonyl</th>
</tr>
</thead>
</table>

11. TERATOGENS

**Storage Precautions:**

- Label all containers Teratogens.
- Store according to hazardous nature of chemical, using appropriate security when necessary.
<table>
<thead>
<tr>
<th>Aniline</th>
<th>Mercury</th>
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</thead>
<tbody>
<tr>
<td>Benzene</td>
<td>Nitrobenzene</td>
</tr>
<tr>
<td>Carbon Disulfide</td>
<td>Phosphorus</td>
</tr>
<tr>
<td>Carbon Monoxide</td>
<td>Radioactive Substances</td>
</tr>
<tr>
<td>Chlorinated Hydrocarbons</td>
<td>Toluene</td>
</tr>
<tr>
<td>Lead</td>
<td>Turpentine</td>
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</tbody>
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