

High Hazard Chemicals - Tools for Assessment

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High Hazard Materials

◆ Peroxide Forming Chemicals & Explosives

☛ Potassium, Ether, Dioxane, Tert-butyl alcohol, Picric acid, Sodium azide, Perchloric acid, Carbon disulfide, Di- and Tri-nitro Compounds

◆ Water Reactives

☛ Potassium, Sodium, Lithium, Calcium carbide, Anhydrous aluminum chloride, Sodium peroxide

◆ Corrosives

☛ Hydrofluoric acid, Perchloric acid, Bromine, Nitric acid

◆ Carcinogens and Toxins

☛ Arsenic, Cadmium, Chloroform, Formaldehyde, Potassium dichromate, Mercury and Cyanide compounds

Specific Chemical Illustrations

- ❖ Figured I'd run through examples of the different haz classes here
- ❖ Chlorates, chromates, nitrates and per-prefixed inorganics for oxidizers
- ❖ Particularly low flash solvents, powdered metals for ignitables

Chemicals of Concern- Chloroform

- ❖ Suspect carcinogen
- ❖ Reacts violently with bases
- ❖ Phosgene generation if:
 - Exposed to light
 - Not preserved
 - Preserved with Amylene
- ❖ Needs alcohol preservative

Chemicals of Concern- *Hydrofluoric Acid*

- ❖ Extremely corrosive
- ❖ Dissolves glass
- ❖ Absorbs thru skin
- ❖ Delayed pain
- ❖ Calcium Gluconate needed to deactivate
- ❖ Deep tissue burns & bone Loss

Chemicals of Concern- Compressed Gases

- ❖ Lecture bottles
- ❖ Small size, rusty valves
- ❖ Typical contents
 - Corrosive gases
 - Poisonous gases
 - Pyrophoric gases
 - Flammable gases
- ← Chlorine gas cylinder in high school stockroom

Chemicals of Concern- Water Reactives

- ❖ Earth Metals
 - Sodium
 - Potassium
- ❖ Calcium Carbide
- ❖ Aluminum Chloride
- ❖ Hydrides
- ❖ Butyl-lithium

Chemicals of Concern - Perchloric Acid

- ❖ Very corrosive
- ❖ Powerful oxidizer
- ❖ Reacts with cellulose
 - Wood, paper, cotton
 - Explosions can occur
- ❖ Reacts with metals
 - Explosive perchlorates
- ❖ Use special fume hood

Chemicals of Concern - Peroxidizable Materials

- ❖ Ethyl Ether
- ❖ Isopropyl Ether
- ❖ Tetrahydrofuran
- ❖ 1,4-Dioxane
- ❖ Potassium Metal
- ❖ Cyclohexene

Chemicals of Concern-

Nitric Acid

- ❖ Yellow color=degraded
- ❖ 1/5 ounce orally = fatal
- ❖ Severe painful burns
- ❖ Explosive mixtures
- ❖ Many incompatibilities
- ❖ Powerful oxidizer
- ❖ Store alone

Mystery Crystals



- ❖ Probably Sodium Hydroxide mix
- ❖ Corrosive
- ❖ Leaking reusable pipettes
- ❖ Contact risk
- ❖ Reaction risk

Chemicals of Concern Inventory

- ❖ Intro the attendees to the chems of concern inventory
- ❖ Describe its layout and utility for schools, labs and as quick reference tool for inspectors or HHW staff receiving obscure lab chemicals.
- ❖ Pass out diskettes with the Excel table.