**PYROPHORIC CHEMICALS**
**STANDARD OPERATING PROCEDURE**

HAZARDOUS CHEMICALS/CLASS OF HAZARDOUS CHEMICALS

- Pyrophoric chemicals are liquids and solids that will ignite spontaneously in air at about 130° F. A listing of some pyrophoric chemicals is at the end of this SOP.

HAZARD DESCRIPTION

- Pyrophoric chemicals can explode or produce a fire.

PROTECTION PROCESS

- Good laboratory technique
- Appropriate shielding through use of personal protective equipment
- Use of fume hood
- Availability of eye wash station and safety shower

PERSONAL PROTECTIVE EQUIPMENT

- Safety glasses/goggles (Wear chemical safety goggles when using small quantities or safety glasses or chemical safety goggles with face shield when using large quantities or when a splash potential exists.)
- Gloves should be worn when handling pyrophoric chemicals. Disposable latex or nitrile gloves provide adequate protection against accidental hand contact with small quantities of most laboratory chemicals. Lab workers should contact OEHS for advice on chemical resistant gloves when direct or prolonged contact with hazardous chemicals is anticipated.
- Lab coats, closed toed shoes and long sleeved clothing should be worn when handling pyrophoric chemicals.
- Additional protective clothing should be worn if the possibility of skin contact is likely.

ENGINEERING/VENTILATION CONTROLS

- Many pyrophoric chemicals release noxious or flammable gases and should be handled in a hood.
- Some pyrophoric materials are stored under kerosene (or other flammable solvents), therefore the use of a fume hood is required to prevent the release of flammable vapors in the laboratory.
- Glove boxes may be used to handle pyrophoric chemicals if inert or dry atmospheres are required.

SPECIAL HANDLING PROCEDURES AND STORAGE REQUIREMENTS

- All pyrophoric chemicals must be clearly labelled with the correct chemical name.
- Pyrophoric chemicals should be stored under an atmosphere of inert gas or under kerosene as appropriate.
- Do not store pyrophoric chemicals with flammable materials or in a flammable-liquids storage cabinet.
- Store these materials away from sources of ignition. Minimize the quantities of pyrophoric chemicals stored in the laboratory.

- Never return excess chemicals to the original container. Small amounts of impurities may be introduced into the container which may cause a fire or explosion.

SPILL AND ACCIDENT PROCEDURES

- Before beginning work with pyrophoric chemicals, develop emergency procedures which address response actions to accidental exposure from fires, explosions, or spills. The procedures should address as a minimum the following:
  - Who to contact: (University police, and Office of Environmental Health and Safety,
  - Principal investigator of the laboratory including evening phone number)
  - The location of all safety equipment (showers, spill clean up supplies, eye wash, fire extinguishers, etc.)
  - The method used to alert personnel in nearby areas of potential hazards
  - Special spill control materials required by the type of corrosive material(s) handled in the laboratory
- Anticipate spills by having clean up equipment on hand. The appropriate clean up supplies can be determined by consulting the material safety data sheet. This should occur prior to the use of any pyrophoric chemicals.
- In the event of a spill, all personnel in the area should be alerted.
- Do not attempt to handle a large spill of pyrophoric chemicals. Vacate the laboratory immediately and call for assistance (Division of Environmental Health & Safety 292-1284 or 911).
- Remain on the scene, but at a safe distance, to receive and direct safety personnel when they arrive.

WASTE DISPOSAL

- All materials contaminated with pyrophoric chemicals should be disposed of as a hazardous waste.
- Alert the Office of Environmental Health and Safety if you generate wastes contaminated with pyrophoric chemicals. These wastes may pose a flammability risk and should not remain in the laboratory overnight.

SPECIAL APPROVAL REQUIRED

- No.

DECONTAMINATION

- Wash hands and arms with soap and water immediately following any skin contact with pyrophoric chemicals.

DESIGNATED AREA

- No.

EXAMPLES OF PYROPHORIC COMPOUNDS

Grignard reagents, RMgX
Metal alkyls and aryls, such as RLi, RNa, R3Al, R2Zn
Metal carbonyls, such as Ni(CO)4, Fe(CO)5, Co2(CO)8
Alkali metals such as Na, K
Metal powders, such as Al, Co, Fe, Mg, Mn, Pd, Pt, Ti, Sn, Zn, Zr
Metal hydrides, such as NaH, LiAlH4
Nonmetal hydrides, such as B2H6 and other boranes, PH3, AsH3
Nonmetal alkyls, such as R3B, R3P, R3As
Phosphorus (white)