



SMU EHS Standard Operating Procedure for use of

PYROPHORICS



Examples: Grignard reagents, metal carbonyls, metal alkyls and aryls, alkali metals, metal powders, metal and nonmetal hydrides

HAZARDS	Potential Hazards	<ul style="list-style-type: none">• May ignite within five minutes of coming into contact with air.• Some pyrophorics may also be corrosive, teratogenic, water reactive, etc.• See Safety Data Sheet (SDS) for specific hazard information.
HAZARD CONTROLS	Selection and Purchase	<ul style="list-style-type: none">• Before purchasing pyrophoric materials, select a compatible fire extinguisher. The extinguisher must be on hand before any work with the pyrophoric material takes place (and preferably before the material is ordered).• Purchase minimal amounts of pyrophoric materials.
	Storage and Transportation	<ul style="list-style-type: none">• Store in secondary containers, away from flammables and oxidizers. (You may be able to reuse the secondary container provided by the manufacturer.)• Pyrophoric liquids should be stored in sealed containers with PTFE-lined septa to prevent air exposure.• Avoid areas with heat, flames, and water.• Some of these materials may need to be kept below threshold temperatures.
	Engineering Controls	<ul style="list-style-type: none">• Manipulate via syringe or cannula in a chemical fume hood with the sash as low as possible.• Pyrophoric solids must be handled only in an inert atmosphere glove box or glove bag.• Mineral oil bubblers must be used to release pressure from reagent or reaction vessels.• Use a blast shield if available.
	Work Practice Controls	<ul style="list-style-type: none">• Before working with these compounds, read the SDS and other reference materials carefully. Good web resources include:<ul style="list-style-type: none">○ UCSD training videos○ Lab Safety Workplace – Handling Pyrophoric Materials training course○ Sigma Aldrich Technical Bulletins AL-164 (Handling Pyrophoric Reagents) and AL-134 (Handling Air-Sensitive Reagents).○ <i>Prudent Practices in the Laboratory</i> (National Academies Press) Sections 4.D and 6.G and Laboratory Chemical Safety Summaries for butyllithiums, sodium metal, and lithium aluminum hydride• Set up a designated area for work with pyrophoric materials – a chemical fume hood and/or a (dry) glove box (with inert atmosphere, if needed) located within 10 seconds of an eyewash/drench hose, safety shower, and an appropriate fire extinguisher.• Incompatible materials should be removed from the area.• A container of powdered lime or sand should be kept within arm's reach (for covering spills).• Employees should be aware of the location of all emergency equipment and should know how to use it if needed.

		<ul style="list-style-type: none"> • Know the location of the nearest compatible fire extinguisher and how to use it. • See the above-referenced Aldrich technical bulletins for recommendations on safe transfer of pyrophoric liquids. • Before conducting the actual procedure, always perform a dry run (without the pyrophoric material) to identify and resolve possible safety hazards. • Work within sight and/or hearing of at least one other person who is familiar with the hazards and written procedures.
	Personal Protective Equipment (PPE)	Minimum PPE: <ul style="list-style-type: none"> • Fully buttoned, flame-resistant lab coat (Nomex material or equivalent) with sleeves extended to the wrists • Safety goggles • Appropriate gloves (leather or Kevlar gloves may be added) • Chemical apron for large quantities • Personal clothing should NOT be of a type that may ignite (such as polyester or nylon). <p><i>Consult the manufacturer's glove guide for effectiveness with the chemical.</i></p>
OTHER	Waste	Collect and store according to SMU Hazardous Waste guidelines.
	Training	<ul style="list-style-type: none"> • Users must be given hands-on training for procedures/experiments involving pyrophoric or other highly reactive materials before beginning work. • Hands-on fire extinguisher training is highly recommended. Contact EHS at 214-768-2430 for more information or to set this up. • All personnel are required to complete an in-person General Laboratory Safety session. • Furthermore, training on these specific procedures must be performed by the PI or knowledgeable designee for all personnel working with pyrophoric materials, and must be documented (topics covered, date, employee names and signatures). All personnel shall read and fully adhere to the laboratory- and chemical-specific SOP for any pyrophorics, and shall document that they have read it by signing and dating the Laboratory-Specific Training document.
	Questions	Contact Environmental Health and Safety at 214-768-2430.
	Additional Guidelines	Additional laboratory-specific guidelines MUST BE detailed on page 3.

Laboratory-specific chemicals and procedures:

Pyrophoric chemicals present in the laboratory:

Circumstances of use:

Exposure Procedures:

Emergency/Spill Procedures: