

Handling of Reactive and Pyrophoric Materials

The tragic death of a UCLA research assistant earlier this year and a recent fire at Texas A&M, highlight the hazards of conducting experiments using reactive and pyrophoric (spontaneously ignite when exposed to air) materials. The technician was fatally burned when the t-butyllithium she was working with came in contact with air and ignited her clothing. Tert-butyllithium, like many other compounds used in chemical synthesis, is reactive. It ignites spontaneously on contact with air. The fire in Texas was caused by sodium metal. Numerous trash can fires have resulted from discarded palladium catalysts. Other compounds, such as alkali metals, react violently with water. A short list of reactive materials commonly used in research includes:

- Boranes
- Borohydrides
- Organoboranes
- Organolithiums
- Organoaluminums
- Grignard reagents
- Alkali Metals (Lithium, Sodium, Potassium, Rubidium, Cesium)

When a procedure requires work with a reactive or pyrophoric material, it is critical that the personnel handling the material be familiar with its hazards as well as the proper handling techniques, emergency equipment and appropriate personal protective equipment. Laboratories using reactive and pyrophoric reagents should develop standard operating procedures and require that each person read and understand all steps needed to handle these reagents safely. Emergency equipment such as, fire extinguishers, safety showers, eyewashes, must be maintained and tested. Records of testing are required as part of the OH&S lab audit. Work with reactive and pyrophoric material should never be left unattended and no one should work alone with these materials.

Standard operating procedures for reactive and pyrophoric materials are provided on the OH&S website in the 'Guides' section:

<http://www.healthsafe.uab.edu/pages/home/manuals.html>

These documents are generic and should be modified to meet each laboratory's specific needs. Contact OH&S at 4-2487 for additional information.