



SAFETY ALERT

Chemical Fire

RISK MANAGEMENT & SAFETY

Event: Chemical Fire
Date: January 2015
Category: Fire/Chemical
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Contact RMS:

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Description:

A small explosion and subsequent fire resulted during the quenching of sodium metal. The sodium was in a round bottom flask (See Photo 1). A graduate student quenched the metal with ethanol. The student poured some of the quenched material into the sink for disposal.

The small explosion and fire resulted because the mixture was not completely quenched and a piece of sodium dropped in the sink contacting water. The sodium metal reacted and the heat of reaction detonated the ethanol vapors. The fire was put out with a CO₂ fire extinguisher.

There were no injuries and only minor property damage from the event.



Findings:

- The graduate student was cleaning and discovered the flask with sodium metal that required quenching.
- The graduate student started quenching the sodium with ethanol earlier that day.
- The graduate student was wearing gloves and eye protection but could not recall if a lab coat was worn.
- The graduate student did not observe any sodium pieces in the solution prior to disposal.
- Lab procedures were available for quenching operations but did not contain a method to check for completion/termination of the process.

Root Causes:

- The lab's Metals Quenching procedure did not outline a means for terminating the activity.
- The graduate student did not observe any sodium particles in the flask.

Recommended Actions:

- Modify the current solvent drying and quenching SOPs to include quenching termination procedure.
- Conduct a PPE assessment. Train all lab personnel on PPE requirements.
- Outline when FR lab coats are to be worn and obtain FR lab coats for the lab personnel to use.
- Train lab personnel on new/modified procedures.