



SAFETY ALERT

Chemical Reaction Fire

RISK MANAGEMENT & SAFETY

Event: Chemical Reaction Fire
Date: June 2014
Category: Fire/Chemical Reactions
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Description:

A small fire resulted in a lab due to a chemical reaction. A grad student observed a drying flask leaking solvent (methylene chloride over calcium hydride). The flask was on a lab jack. It was previously attached to a vacuum line but the glassware failed causing it to fall and crack. The graduate student moved the flask to the sink and turned on the water. The calcium hydride reacted with the water which began to smoke from the heat of reaction. While retrieving a fire extinguisher from an adjacent lab, a fire erupted and contacting solvent bottles stored around the sink. The building was evacuated. The ND Fire Department responded.



Findings:

- The glass connector cracked resulting in the flask dropping from the vacuum line and striking the lab jack causing a crack in the flask. Solvent leaked through the crack.
- The leaking flask was moved to the sink rather than a lab hood because the hoods contained clutter resulting in limited space for the graduate student to place the leaking flask.
- Calcium hydride was used as a drying agent for the methylene chloride and it reacted with the water in the sink.
- Lab procedures were available for performing drying of solvents using methylene chloride but did not contain emergency response procedures.
- The University 's emergency reporting process was followed by lab personnel.

Root Causes:

- There was no emergency procedure available for quenching of calcium hydride.
- There was no process for supporting flasks suspended on vacuum lines.
- No standard of housekeeping is available and housekeeping is not maintained.

Recommended Actions:

- Modify current solvent and quenching SOPs to include: support for flasks on vacuum lines, procedures for "runaway reactions" and emergency response procedures.
- Train lab personnel on new/modified procedures.
- Develop a housekeeping standard and communicate to all lab personnel.

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