



SAFETY ALERT

Burn to Hand

RISK MANAGEMENT & SAFETY

Event: Burn to Hand
Date: February 2015
Category: Injury/ Burn
RMS Contact: Lisa Phillips, Bognar.6@nd.edu

Contact RMS:

Tel: 631-5037

Description:

A post-doctoral researcher was burned while attempting to pat out a chemical reaction fire, receiving 1st and 2nd degree burns. The fire occurred on an open bench while the researcher was adding methanol to a round bottom flask containing a substrate (Benzyl (1- methoxy-2 oxoazetidin-3YL) carbamate) and Palladium on Carbon (Pd/C).

The researcher had been holding the round bottom and the flask with methanol when the fire started. The researcher dropped both flasks on the lab bench spreading the fire to the paper bench covering.



Findings:

- Researcher was wearing gloves and standard lab coat (not FR), but was not wearing safety glasses.
- Researcher had performed this procedure once before.
- Researcher had increased the amount of Pd/C from 10 mg to 100mg for this experiment.
- Researcher added methanol to the Pd/C.
- Researcher was working on the open bench and holding the reaction flask.
- Researcher tried to pat the fire out with hand.
- No emergency response procedure was available in the lab.

Root Causes:

- During the hydrogenation of Benzyl (1- methoxy-2 oxoazetidin-3YL) carbamate, the Pd/C reacted with oxygen and methanol vapors.
- The Pd/C should have been added to the methanol substrate mix.
- The hydrogenation was conducted on the open bench with protective paper covering. When flasks were dropped, the fire spread to the paper covering the lab bench.
- There was no written procedure for this reaction including engineering, ppe and emergency response.

Recommended Actions:

- Develop an oversight process for changes in experimental setup (e.g. change of solvent or increasing the quantity).
- Develop a written procedure to include: use of a hood, FR lab coat, process to secure reaction flask so that it does not have to be held.
- Train personnel on the new procedure and emergency response.