

LESSONS LEARNED MEMO

FIRE CAUSED BY PROPANE TORCH AND HEXANE IN A CHEMISTRY RESEARCH LAB

What Happened:

A Chemistry graduate student was working in FRH building around 10:30 pm with hexane inside a cluttered fume hood. The experiment involved collecting hexane through a column in glass test tubes in a metal rack. The student was in process of using a propane torch to heat glassware in the hood when the freestanding torch was accidentally knocked down by the student's elbow while reaching for something else. The torch cracked the glass tube and the hexane caught on fire. An uncapped four-liter hexane bottle on the floor and the adjacent cardboard box also caught on fire.

The student picked up the nearby fire extinguisher and extinguished the fire. Most probably the dust from the fire extinguisher activated the fire alarm.

The student was using safety glasses and nitrile gloves at the time of the incident. No one witnessed the incident but there were three other students working in the nearby labs.

What Was Learned:

It is absolutely essential to remove all sources of flammable liquids and gases before using an open flame. It is crucial to maintain a clutter-free lab and fume hood. The cluttered fume hood may have contributed to knocking over the torch.

Incident Root Cause:

The root cause of the incident was carelessness in not removing nearby open flammable solvents before igniting the propane torch. A contributing factor was poor housekeeping and cluttered workspace inside the fume hood.

Recommended Corrective Actions:

- 1. Before igniting an open flame, absolutely make sure there are no flammable liquids or gases in the area.**
- 2. It is vital to always keep heat or flame-producing devices properly located and secured (if possible) so that accidental fall is eliminated.**
- 3. Never work alone while handling hazardous materials or operations.**
4. Make a conscious effort not to overcrowd the hood with other glassware and supplies – keep it neat and clean with only those items needed in the assigned experiments.
5. The location of hazardous operations must be properly and adequately separated from the location of stored hazardous materials.
6. Must have a written SOP approved by the PI for all hazardous operations and follow it strictly.
7. Always use Personal Protective Equipment (PPE) like proper gloves, lab coat, and goggles when working with hazardous chemicals.
8. Prepare in advance to use the safety equipment like the fire extinguisher and know their location while working with fire causing experiments.