

Skin Burns from Heating Glass Vessel

What Happened?

A researcher was heating a small volume (<30mL) of hexanes/ethyl acetate containing approximately one gram of an organic azide. The solution was placed in a capped, 40mL pyrex media storage bottle. Holding the bottle of the azide solution in their left hand, the researcher was heating it with a heat gun with their right hand behind a horizontal fume hood sash protecting their face and torso.

The bottle shattered in the researcher's hand due to excess pressure generated by the heated fumes in the vessel. The hot solution burned through the nitrile glove and part of the researcher's skin causing some burns and blisters.

What went right?

- The researcher was wearing the appropriate eye protection and lab coat
- The researcher was working with the fume hood sash at the correct height, using it to protect their face and upper body
- The researcher immediately washed their left hand with copious amounts of water for 15 minutes
- The researcher was not working alone and asked a colleague to take them to the nearest hospital for further examination

What should be done differently?

- The reaction vessel should have been clamped inside the fume hood before heating
- A smaller scale of the azide (less than gram quantities) should have been handled
- Researchers should have reported the incident to EH&S at the time of the incident

What corrective actions have been taken/will be taken?

- EH&S is working with the College of Chemistry in establishing timely reporting responsibilities by researchers and Principal Investigators
- This incident was discussed during the lab's group meeting. The lab discussed the proper handling and heating of potentially explosive compounds.

Lessons Learned

Incidents involving heating of potentially explosive compounds and volatile solvents should be executed with care. Clamp reaction vessels to be heated as opposed to direct handling. Scale down reaction quantities as much as possible.