

## Researcher Injured while Synthesizing an Alkyl Azide

A researcher had just finished synthesizing an alkyl azide and was disassembling the apparatus when the product detonated. Approximately 10 grams of the material was in a three-neck flask inside a metal dewar. The researcher received a number of serious injuries to his right hand which required hospitalization.

### Lessons Learned

1. The researcher had properly placed the fume hood sash between himself and the apparatus. The researcher was also wearing safety glasses and chemical protective gloves. The fume hood glass absorbed the outward force of the explosion, protecting him from serious injury to his face and chest. OHS recommends that fume hood sashes always be positioned between the user and experiment, especially when an experiment involves pressure, heat or a potentially reactive chemical. An additional blast shield should be employed when there is a possibility of a physical or chemical explosion (see description at right). This particular injury, a hand injury while adjusting the apparatus, would not have been prevented by such a shield.
2. After the explosion, the researcher immediately placed his hand under running water. Another colleague immediately called 911 and MSDS's were quickly obtained to give to the responding emergency personnel. The prompt response by laboratory personnel mitigated the injury to the researcher.
3. Process safety reviews for highly hazardous operations, such as use or synthesis of reactive chemicals, use of highly toxic chemicals or experiments involving pressure should also be completed. In most cases a "dry run" is also completed to eliminate any safety problems that may arise before the hazardous chemicals are actually used. A process safety review involves a discussion of all possible hazards that might be encountered and what actions are required to minimize or eliminate the hazards. These reviews should at least involve the principal investigator and the lead researcher, but can include other colleagues from within the department or Occupational Health and Safety. This review/training should be documented.

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