



Learning by Accident: Nitrogen Tri-iodide — Unprepared for this explosion!

««« Submitted by a member of the STAO Safety Committee

Learning by Accident is an ongoing *Crucible* feature, in which real-life lab accidents or incidents are recounted and explained. The goal is to highlight the consequence of ignoring safety rules so that science educators will be further encouraged to become knowledgeable, and to take appropriate action, in areas of safety that affect their daily activities in the science classroom. Submissions are encouraged. Anonymity will be guaranteed. Please send written descriptions to Ian Mackellar, STAO Safety Committee Past-Chair, Box 191, MAITLAND, ON K0E 1P0, or email: ian_mackellar@stao.org



Curriculum Connection: Chemistry 12U.

A sudden and very loud bang from the fumehood – another accidental explosion of NI_3 ?

The student was standing at the fumehood, with the window halfway down and arms inside, pouring the mixture into a filtration apparatus. The ammonia-iodine mixture in the beaker had been left overnight but apparently was not yet completely dry. The student held the beaker with beaker tongs. The two teachers who were present in the lab, but not observing the student, heard a sudden loud bang – the beaker had fallen in the fumehood and, it seemed, the nitrogen compound had exploded. Although the student's head was outside the fumehood window, a tiny particle of undetermined nature went into his eye. The particle was removed at the hospital and no further consequences ensued. He was lucky! We were lucky!!

Background – the teacher acceded to the student's request to prepare this material using a procedure obtained from the Internet. The procedure called for the use of 3 grams of solid iodine. This was a first-time preparation for the student; the teacher had not previously done it herself. A senior teacher in the department was well known for preparing and carrying out this demonstration every year for the Chem 12U course.

Comments from the STAO Safety Committee

It is possible that the beaker first slipped out of the tongs and broke on the fumehood floor setting off some partially dried compound. (The teachers thought they first heard the sound of breaking glass a moment before the accident). Had the slippage not occurred, the incident may not have taken place. Nevertheless, the amount of 3 grams was far in excess of that used by the senior teacher (0.3 g) who also avoided the filtration step in his preparations. Had this teacher been consulted by either the student or other teachers beforehand, he would have advised the reduction in quantities and not permitted the solution to stand overnight. He would also have stayed with the student for the relatively short time required to carry out the complete preparation.

Sometimes the greatest error lies in less experienced teachers not consulting with those in a better position to advise.

