



Learning by Accident

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 effect their daily activities in the science classroom. Submissions are encouraged. If requested, anonymity will be guaranteed. Please send written descriptions to Ian Mackellar, STAO Safety Committee Chair, Box 191, MAITLAND, ON KOE 1P0

A Nasty Spill!!!

I was cleaning up and packaging old chemicals for elimination at the end of the school year. It was a hot, humid June day. As I picked up a bottle of liquid bromine in the fume cupboard, the bottle slipped right out of my rubber-gloved hand and smashed onto the floor. Lucky for me, I did not get a drop on myself! However, the spilled liquid bromine started to evaporate almost immediately and the brown vapour began to rise. I phoned the Principal to contact the fire department. In the meantime, I evacuated the laboratory. The fire department team arrived shortly thereafter. Luckily, I had updated the MSDS sheets, all in a binder in the office, and could direct the firefighters on cleanup. I told them they had to use their breathing apparatus. The spill area was flooded with sodium thiosulfate solution and the windows were opened to ventilate the lab. Things worked out all right in the end and there were no casualties or injuries.

Comments from the STAO Safety Committee

The science teacher involved should be commended on the actions taken. Bromine vapour is very toxic and the liquid causes severe burns to skin and eyes. In the event of spillage, it is crucial that appropriate action be taken immediately. Protective eyewear and gloves, preferably nitrile, should be worn. The laboratory should be evacuated and all windows opened to ventilate the area. For a small spill (1 mL or less), the spill area should be flooded with a 10% sodium thiosulfate

« « « Submitted by a STAO Member, Region 4.

or sodium carbonate solution before mopping up and rinsing the area with lots of water. For larger spills, emergency services should be called.

Because of its extremely hazardous nature, the STAO Safety Committee does NOT recommend the use of pure liquid bromine in school science laboratories. This chemical has associated risks that are so great they outweigh the educational value of its use. Indeed, most local District School Boards have included elemental bromine in their lists of banned chemicals. (See STAO publication *Stay Safe!* page 38)

The main use of liquid bromine in school science is to prepare bromine

water. This reagent can be used safely by students in testing for unsaturation in organic compounds. Two alternatives are to:

- Prepare the bromine water in situ by adding a solution of sodium hypochlorite to a solution of sodium or potassium bromide. (See STAO publication *Laboratory Recipes*)
- Substitute the bromine water with an alkaline solution of potassium permanganate.

If bromine water is needed to investigate substitution reactions involving the halogens, then it should be prepared by method (a) identified above.



You Have Safety Questions? We Have Safety Answers!

« « « By the STAO Safety Committee

The STAO Safety Committee welcomes enquiries, with respect to safety issues, from STAO members. Please send your questions to the Safety Committee Chair (refer to page 4 'Committee Chairs'). Your questions and the STAO Safety Committee responses may be published in Crucible, particularly if the information is deemed of general interest to other STAO members. Anonymity, however, will be guaranteed.

QUESTION # 16: What are the safety issues regarding the use of diluted iodine in the science laboratory? Do you have any specific recommendations or do you know where I can find additional

safety information other than that which is found in *Be Safe!*?

RESPONSE: Solutions of iodine can either be aqueous or alcoholic. The latter obviously are highly flammable