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 K0E 1P0*

The following accident report, extracted from "Speaking of Safety" (Winter 2000/01)", is reproduced with permission.*

«« **By Ian Mackellar**
Ian Mackellar is a STAO Past President and is currently Chair of the STAO Safety Committee.

School explosion sends students, teacher to hospital

As reported in The Salt Lake Tribune, on Friday 3rd November, 2000
HYRUM — South Cache Center is closed today and students are being offered counseling to help them cope with a science experiment gone explosively awry that sent more than two dozen eighth-grade students and their teacher to the hospital Thursday.

At 9:45 a.m. an explosion during an experiment with methanol sent shards of glass flying with such force that splinters were embedded in the classroom's brick wall and the ceiling. The blast also broke two windows at the rear of the room. Students, seated in pairs at tables on the sides and in front of science teacher Lance Hansen, took the blast of glass in their arms, shoulders and faces. There were no eye injuries.

"We're very fortunate this wasn't more serious," said Cache County Schools' Deputy Superintendent Chad Downs. As Hansen was being treated at Logan Regional Hospital, he took time to apologize to the 13 students taken there by ambulance. Hansen also received counseling from a hospital social worker. "He's very traumatized by this," said Kirk McRae, Cache District's personnel director. "He really connects well with the students. That's the hardest thing for him to deal with – his sense of responsibility in this."

One girl and one boy spent the night at the hospital after undergoing surgery for facial cuts. Tycen Sigler and Ashley Robinette were expected to be released today.
Hansen and 13 students were treated for cuts and released. Seventeen others were taken by school bus to the hospital as a precaution and then released.

Principal Tom Bailey said Hansen, in his second year as a science teacher, had done the experiment many times before. "He has no idea why it went haywire," Bailey said.

Hansen was using a table in the front and middle of the room to conduct the experiment using a five-gallon glass jug. A flame or spark ignited the methanol vapors as they streamed out of the container's opening as part of the teacher's demonstration.

Hansen did not want to discuss the purpose of the experiment or why it might have failed, his wife said Thursday afternoon.

Bryan Woodward of Wellsville, 14, said the students watched Hansen perform the experiment earlier without incident. "We added more gas (sic) to make it last longer and make it more exciting," he said. Woodward, who had a 3-inch horizontal gash in front of his ear and another cut on his shoulder, was one of the students stitched up at Logan Regional.

Further Comments

I personally found this newspaper report interesting as, like many chemistry teachers in Ontario, I performed this demonstration routinely to show the effect of increased surface area on rate of combustion. However, I always used a 5 gallon plastic (not glass!) water jug as the reaction vessel and ethanol, rather than methanol, as the fuel. The use of eye protection and safety shields is also appropriate if this teacher demonstration is to be performed.

It should be noted that, although perhaps somewhat less exciting, there are safer alternatives for demonstrating the effect of increased surface area of reactants on the rate of a chemical reaction e.g. reaction of calcium carbonate (marble chips/powder) with dilute hydrochloric acid; combustion of iron (strip or bar/wool/ powder) on placing small samples in a Bunsen flame.

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