

Case Study – Fire in Wilson Pharmacy Building

Date: Oct. 1, 2003
Initiating chemical: *Isoamyl Nitrite*
Molecular formula: $C_5H_{11}NO_2$

- **Toxic**, harmful by inhalation, skin absorption and ingestion.
- **Flammable**, Peroxide former, Unstable, Forms explosive mixtures with air or oxygen.
- Incompatible with oxidizing and reducing agents, acids, alcohols
- DOT Hazard Class 3, Packing Group II, UN 1113

On October 1, 2003, a fire began and blazed through a lab on the 3rd floor of UGA's Wilson Pharmacy building. The local fire department responded along with UGA's HAZMAT team. State, local and UGA officials worked together to control the fire and conduct the following investigation. The situation was unique in that radioactive sources, biohazard agents and chemical hazards were all present in the lab. The fire itself was contained to a great degree but there was still significant damage. Upon completion of the investigation, it was determined that improper clean up of a chemical spill of Isoamyl Nitrite was the culprit of the fire. The following is a chronological order of events that took place during this incident.

Key Events

- Lab involved in the Pharmacy building contained numerous hazards including radiated vectors, biological agents and chemicals representing every category of chemical hazard.
- **New graduate students** were working late in the evening until 11:00 pm to 12:00 midnight. These students had been working in this lab only two to three weeks.
- During the course of their work, a container of **Isoamyl Nitrite**, a flammable liquid, was **spilled**.
- The material was spread on the floor in front of and inside of a refrigerator. This unit was possibly a flammable storage refrigerator but was confirmed to not be an intrinsically safe (explosion proof) unit.
- The Isoamyl Nitrite was promptly cleaned up from the floor in front of and inside of the refrigerator; however, the spilled liquid had also made its way under the refrigerator, which **was NOT cleaned up** with the rest of the spill.
- After the students left the building close to midnight, the vapors rising from the volatile liquid accumulated in a concentration breaching its lower explosive limit.
- Approximately 7:00 am Oct. 1 the refrigerator's compressor cycles on, generating a **small spark and igniting the chemical's flammable vapors**. Smoke detectors function shortly after fire starts however the pharmacy building has no sprinkler system to combat the fire.
- The fire soon overtook other flammable materials in the lab. The refrigerator and adjacent fume hood contained a large quantity and variety of flammables and were in flames in a matter of minutes.
- Athens Clarke County (ACC) Fire arrives on the scene **within 15 minutes**. Meanwhile, the fire has risen dramatically in size and temperature due to the availability of flammable materials in close proximity.

- The fire becomes hot enough to melt a copper water-piping link. This link's placement was a fortunate occurrence as the resulting free flow of water helps control the fire from spreading further and also covers a hydrogen cylinder in the same area of the fire with water. Had this cylinder not been cooled with the flow of water, it, in all probability would have heated to the point of explosion, possibly taking out the corner of the building and injuring first responders as well.
- ACC Fire Department extinguishes the fire in short order and due to other hazards present, UGA's Hazard Assessment Response Team (HART) arrives to assist in restoring stability to the situation and the investigation begins.
- The fire did reach temperatures high enough to cause structural damage to the concrete portions of the building but caused no imminent threat to prevent employees from entering the building.
- The majority of the damage was water and smoke destruction as opposed to structural. Water from melted pipes and Fire hoses covered most of the 3rd story and made its way down through the ceiling and walls to the floors below causing widespread damage.
- Early estimates put the damage figures at about 2 million dollars.

Preventative steps and lessons:

- Upon spillage, all electrical appliances should have been powered down.
- Only utilize intrinsically safe refrigerators to store flammable and reactive chemicals in, not conventional or flammable storage refrigerators.
- Spill clean-up techniques should be more thorough. Be sure to get all material cleaned up, regardless of where it is.
- Proper usage of an MSDS would have revealed the special considerations warranted by the use of this chemical.
- Is it wise to have employees that have been on the job only two to three weeks working late into the night by themselves with such hazardous materials?
- If it moves, train it! Situations such as these illustrate the value of training and how it can contribute to a university's bottom line.

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