

ACCIDENTS IN HEBREW UNIVERSITY LABORATORIES

Accident in the Institute of Chemistry, Philadelphia Building 06/06/2010

Explosion and fire resulting from a reaction with an unidentified liquid

WHAT WE LEARNED FROM THIS INCIDENT:

1. Make sure that every package has a label with clear and legible information.
2. Make sure to lower the fume hood as far as possible.
3. Personal protective equipment is the last line of defense to prevent accidents and limit injuries. It has been proven that using personal protective equipment prevents serious injuries in workers involved in laboratory accidents.
4. It is important to participate regularly in fire drills: the worker operated a fire extinguisher, put out the flames and prevented development of a serious fire.
5. Appropriate emergency response by the staff, including providing first aid to the injured and notifying the Campus Security Unit.

INCIDENT SUMMARY

An experienced, veteran worker in the Institute for Chemistry was sent by the Institute administration to remove chemicals from a laboratory which had been cleared to enable renovation for a new faculty member.

The worker emptied a container containing about a liter of alcohol into the waste container. Afterwards, he began to pour – into the same container – **an unidentified liquid which was in a 250 ml container, on which was written "Waste"**. After about half a minute, the worker noticed that the liquid was bubbling and fumes were rising from the waste collection container. At this point, the fume hood sash was half lowered. He managed to take one step back and then there was a powerful explosion. The worker was injured from a number of glass shards in his arms and abdomen and from a mild burn on his forehead. He was wearing safety glasses as well as gloves and a lab coat. An opened container with sodium was in the fume hood and the sodium began to burn in the right corner of the fume hood.

Workers who came to the incident scene called the Security Unit and helped him to evacuate. One worker took a fire extinguisher and began to extinguish the fires.

Safety incident in the Faculty of Agriculture Building H **30/07/2019**

WHAT WE LEARNED FROM THIS INCIDENT:

1. Do not use an exposed flame without supervision.
2. Consider changing to safer methods that do not use gas. If this is not feasible, switch to a safety Bunsen burner.

INCIDENT SUMMARY – AS DESCRIBED BY THE CAMPUS SAFETY OFFICER

During a random survey in Building H, the Safety Officer discovered two gas burners operating without supervision. Workers in the area did not know who had worked there.

Fire in a laboratory in the Philadelphia Building 21/02/2017

WHAT WE LEARNED FROM THIS INCIDENT:

1. Immediately deal with electrical hazards.
2. It is important to participate in fire drill training: the worker operated a fire extinguisher, extinguished the fire and prevented development of a more serious fire.
3. Use flammable materials according to the guidelines and keep them far away from energy sources.

INCIDENT SUMMARY

A fire broke out in a laboratory when ether (a flammable material) was poured from a liter bottle into another container. A spark caused by an electrical short from a faulty outlet set the ether fumes on fire.

The Laboratory Director used a fire extinguisher. The Laboratory Director noted afterwards that a Safety Department fire drill which he had completed a few weeks before the incident definitely contributed to the efficient and quick use of the extinguisher. There were no injuries.

Explosion in glass vacuum system 19/02/2017

WHAT WE LEARNED FROM THIS INCIDENT:

1. Work according to certified and authorized procedures.
2. Perform laboratory activities while controlling risk factors and using engineering protection and personal protective devices, as mandated by regulations.
3. Reduce risks by using safe alternatives.

INCIDENT SUMMARY:

An explosion occurred in a glass vacuum system used for experiments with inert gases. The explosion occurred during the semester recess when the instructors rehearsed the planned experiments. The explosion occurred as a result of actions which were not performed in the correct order.

The recommendation being considered is replacement with a stainless steel vacuum system.

The accident did not result in injuries, however, it is a serious incident with a clear potential for injuries. The explosion scattered shards of glass over a radius of several meters. Fortunately, the instructors who had left the room two minutes before were not injured from glass shards flying through the air.

Hydrogen explosion in the Night Laboratory of the Chemistry Laboratories 06/06/2017

WHAT WE LEARNED FROM THIS INCIDENT:

1. Attaching a hydrogen gas tube to a reaction vessel (autoclave) will be done by an experienced and skilled worker who has been authorized by the Laboratory Director.
2. Use personal protection equipment according to the guidelines.

INCIDENT SUMMARY:

Two MSc students conducted an autoclave experiment with flammable hydrogen gas. As reported by one of the students, a powerful explosion occurred when they opened the hydrogen valve leading to the autoclave, causing a fire. One of the students was injured by flames on her back. An ambulance was called and she was evacuated to the hospital.

Conclusions:

1. This was an extremely dangerous incident which could have ended in a fatality!
2. According to the Laboratory Director, the hydrogen leak occurred because of a faulty joint between the gas line and the autoclave.
3. If a cotton lab coat had been worn, most or all of the injuries would have been prevented.

Working safely with hydrogen gas in a laboratory

Safety hazards

Several characteristics make hydrogen gas especially hazardous:

- a. The gas has no color or odor, so it is difficult to detect a leak.
- b. An explosion can occur over a wide range of hydrogen-air mixtures (the explosive range of the gas is between 4.1% - 74.2% hydrogen in air).
- c. The combustion energy is low – the gas can be lit from many sources of sparks found in a laboratory.
- d. A fire or explosion emits large amounts of energy.
- e. If there is a hydrogen leak from a compressed cylinder, a large amount of hydrogen might be released in a short time.
- f. If there should be a leak in a closed space, the hydrogen might displace the oxygen, decrease its concentration in the air and cause suffocation.

Preventing explosion

1. Hydrogen generator.

In order to prevent the danger of explosion due to the use of a compressed hydrogen cylinder, using a laboratory hydrogen generator is permitted in Hebrew University laboratories instead of compressed hydrogen cylinders. This instrument is based on the principle of hydrolyzing water and producing a limited amount of gas at a relatively low pressure. The limited amounts of gas produced, together with the safety features of the instrument, prevent the possibility of a large amount of gas leaking into the room.

2. In cases in which a hydrogen generator is not applicable, contact the Campus Safety Officer.