

Safety Sharing



Lab Safety Knowledge Sharing

Dec. 2022

1. Case sharing

Case 1:

At 19:45 Nov.26.2022, a fire broke out in the lab of the Nanjing Agricultural University Research Building. Around 19:55, firefighters arrived, and put out the fire. No casualties occurred. Cause of the accident is under further investigation.

Case 2:

At 0:42 Feb.27, 2019, a fire broke out in a lab on the Dingjiaqiao Campus of Nanjing University of Technology, and an open flame burst out from the roof of the lab building.

Case 3:

On Dec.19, 2007, a fire broke out in a lab of a university in Tianjin. The direct cause was that the connection between the experimental regulated power supply and the active electrical socket was short-circuited due to aging, and the sparks fell on the carton containing the asphalt, causing a fire.

The aging of the wire will cause the insulation performance to decrease and short circuit to occur easily. Especially in wet weather, although the appearance of the wire is intact, the insulation capacity has been greatly reduced. Moisture infiltrated into the metal conductor, causing it to short circuit and cause a fire in the electrical line.

In addition, improper contact between wires and wires, plugs and sockets, etc., corrosion, or oxide layers will cause excessive contact resistance, generate arcs, sparks, and cause fires.

Safety is no small matter. It is hoped that all staff can improve the safety awareness, conscientiously implement the safety requirement, deal with potential risks, resolutely put an end to fluke psychology, and effectively build a campus safety line to prevent incidents happen.



Figure 1 The lab of Nanjing Agricultural University caught fire



Figure 2 The lab of Nanjing University of Technology caught fire

2. Root causes of winter fire

- 1) In winter, the wind and the things are dry, the water content is reduced, and they are easy to burn in case of fire, and the fire risk level is high. Substances that can undergo chemical reactions when exposed to water will explode and cause fire when exposed to rain or moisture.
- 2) In winter, the use of fire, electricity, and gas are increased significantly, and the number of fire causes is increasing accordingly.
- 3) Inferior electrical equipment, random or additional extension connection of electrical lines, overload and overload lead to short circuit;
- 4) Winter brings the relatively dry and prone to static electricity.



Picture comes from Internet

3. How to prevent

a) *Anti-static*

Static electricity is a common phenomenon in winter, whether it is the human body, equipment or facilities, it is easy to generate static electricity. Generally speaking, static electricity will not cause harm, but it is also necessary to prevent fires, explosions and personal injury accidents caused by static electricity, especially when using some unstable reagents or other flammable and explosive products, special attention should be paid to the elimination of static electricity.



Picture comes from Internet

b) *Checking Lab fire-setting*

Check to ensure that the fire-fighting facilities and equipment in each lab are complete, intact and effective. After entering the winter, all fire-fighting facilities and equipment should be in a standby state.

4. Additional Considerations in lab

1) *Prevent poisoning and suffocation*

a) Due to the cold winter, in order to keep warm, people like to close the doors and windows to make the indoor air bad condition, which will easily lead to the accumulation of various unpleasant, corrosive, toxic or explosive gases. If these harmful gases are not vented outside in time, they will cause indoor air pollution and affect the health and safety of experimenters. Therefore, the lab should be ventilated regularly.

b) In an environment that produces toxic and harmful gases such as carbon monoxide, the lab should also be equipped with a gas leakage alarm device while ventilating well. The lab ventilation requires all fresh air to come from the outside, and 100% of the indoor air is exhausted outside. The chemical lab requires more than 10 air changes per hour, and the air change can be reduced to 6 times when there is no one in the lab.



c) The exhaust of lab fume hoods is not allowed to circulate indoors. The number of fume hoods

should be designed to be sufficient, and should not be used as the only indoor exhaust device. A local exhaust system should be installed above the instrument room or the instrument that produces harmful substances.

2) *Prevent reagents from being stored too cold*

- a) Generally, people pay attention to the safety matters of storing chemical reagents in hot weather, but ignoring the cold will also cause safety hazards in the storage of chemicals. Reagents that use water as a stabilizer should be stored at a suitable low temperature to prevent the danger of freezing and rupture of the container.
- b) Some chemical raw materials and products that are easy to deteriorate when exposed to low temperature should be kept warm. Raw materials and products that are afraid of heat should not be placed near stoves and heating equipment, and should not come into direct contact with high-temperature items to prevent accidents.



5. Emergency response for fire in lab

Once a fire breaks out in lab, do not be panic, keep calm, put out the fire correctly according to the specific situation and contact the campus fire department immediately:

1. When the combustibles in the container catch fire, cover it with a fire blanket.
2. When oily-organic solvent is on fire, never use water to put out the fire.
When water-soluble organic solvents such as ethanol and acetone catch fire, water can be used to extinguish the fire.
3. When wires, electrical appliances and instruments catch fire, the power supply should be cut off first, and water should not be used. Dry powder or carbon dioxide fire extinguishers can be used to extinguish the fire.
4. When your clothes are on fire, never run in panic to avoid the wind booster the fire. You should take off your clothes quickly (or wrap them in fire blanket immediately), and spray with water.



We must keep in mind: refuse to fluke, avoid anxiety!

Nothing we do is worth getting hurt for!