precautions must be observed. It is also toxic and corrosive to the skin, and contact with the respiratory or gastrointestinal tract can cause severe irritation.

Here are some examples of workplace chemical hazards:

1. **Solvents**: Chemicals used for cleaning or degreasing that can cause respiratory issues or skin irritation.
2. **Pesticides**: Chemicals used in agriculture that can be toxic to humans if inhaled or absorbed through the skin.
3. **Heavy Metals**: Substances like lead, mercury, or cadmium that can cause serious health problems, including neurological damage.
4. **Acids and Bases**: Strong acids (like sulfuric acid) or bases (like sodium hydroxide) that can cause burns or respiratory issues if inhaled.
5. **Fumes and Vapors**: Emissions from processes like welding or painting that can be harmful if inhaled.
6. **Dust**: Fine particles from materials such as silica or asbestos that can lead to respiratory diseases.
7. **Chemical Reactions**: Situations where chemicals interact to produce toxic gases or heat.
8. **Biological Hazards**: Chemicals produced by living organisms, such as mold or bacteria, which can pose health risks.
9. **Formaldehyde**: A chemical used in various industrial processes that can cause irritation and long-term health effects.

Chemical Burns

Chemical substances cause burns to the human body as a result of direct contact, not as a result of heat. These substances may take one of the following forms:

1- Acids: sulfuric acid, chloric acid, nitric acid, glacial acetic acid, etc.

2- Alkalis: caustic soda, potassium hydroxide, ammonia, lime, and ammonia.

3- Salts: salts of certain elements such as phosphorus, antimony, bromide, and selenium.

4- Gases: Chlorine gas, ammonia gas.

5- Powders: Disinfectants and disinfectants.

Chemical burns require immediate medical attention, as the passage of time is not in the victim's best interest, as it leads to greater harm to the person. Water is considered the best means of treating chemical burns, provided that it is poured over the affected area in large quantities and as quickly as possible. When dealing with chemicals in school laboratories, whether during handling and storage, preparing for experiments, or while students are conducting experiments prescribed in the curriculum, any individual may be injured due to failure to follow occupational health and safety procedures, resulting in skin burns or eye injuries, as explained below:

First: Chemical Skin Burns

The injury occurs as a result of direct contact with the human body or exposure to the aforementioned chemicals, the most important of which are:

acids, alkalis, and gases.

(1) Acids:

They are divided into two types based on their effect on the human body:

A - Rapid-acting acids, which cause direct burns to the affected area, in addition to the appearance of blisters or spots in the same area.

B - Slow-acting acids, which do not cause pain to the affected person immediately after exposure to the acid, but rather cause pain after a period ranging from 1/4 to 2/10 hours, which is sufficient for the acid to penetrate deeply into the skin.

2) Alkalis

Burns caused by exposure to alkalis have a greater impact on humans than burns caused by acids, because they have a faster ability to penetrate internal tissues and skin cells. Their negative effect on tissues remains for a longer period of time, even after they are washed with water or neutralized with harmful substances. In this case,

after the alkaline solution penetrates the skin tissue, the burn appears pale and appears saturated with water. Then, a superficial growth occurs, followed by a deep swelling.

First Aid for Chemical Burns

1. Remove the cause of the burn immediately by washing the affected area with running water as quickly as possible. This process should last at least ten minutes.

2. Avoid using pressurized water to avoid damaging the injured person's skin; instead, water should be poured gently.

3. Remove the injured person's clothing if possible if exposed to chemicals. Do not pour water or the chemical onto the clothing.

4. Neutralize the chemical to mitigate its effect on the injured area as follows:

Burns caused by acid exposure should be neutralized by applying a weak alkaline solution, such as baking soda, to the affected area.

Burns caused by alkali exposure should be neutralized by applying a weak acid, such as diluted vinegar, citric acid, or lemon juice. Do not use this solution in the eye area. A solution called neutral phosphate solution is also used, which has the ability to neutralize acids and alkalis.

5. After neutralizing the chemical that caused the burn, the injured area should be washed again with water, dried, and bandaged using a clean gauze bandage, taking care not to open skin blisters to reduce the area exposed to microbes.

6. The injured person should receive first aid if they experience other complications, such as pain or shock.

7. The injured person should be transferred to the hospital after first aid treatment if necessary.

Eye Injuries from Chemicals