

Chapter 7 Q&A about problems

1. First-aid measures

Experiments in which chemical substances are handled are always accompanied by hazards. In the event of an injury attributed to chemical substances, appropriate measures must be implemented. SDSs of toxic and hazardous chemical substances indicate how to implement measures. When handling these chemical substances, make sure to read the instructions for implementing measures.

* When a victim is obviously in a serious condition, contact the ambulance service immediately.

If a victim is unconscious, is not breathing, does not have a pulse, suffered serious burns, accidentally ingested toxic chemical substances, or inhaled a large amount of chemical vapor, etc., contact the ambulance service without hesitation.

In such cases, completely stop the experiment and the use of gas or fire to prevent a secondary accident.

(1) In the case of serious burns

If the area of the burns is small, flush chemical substances using running water and cool the area with running water until pain or heat sensation subsides.

If the area of the burns is large, gently pour water over the clothes to cool the area sufficiently, and then cut the clothes using scissors to remove the clothes. If the clothes adhere to the skin, do not remove the clothes forcibly.

(2) In the case of accidental ingestion

In general, have the victim drink water in the case of ingestion of fat-soluble substances or milk in the case of ingestion of water-soluble substances. Put fingers or an object with a round tip into the throat to induce the victim to vomit. Bring the vomit when visiting a hospital to consult a physician.

Do not force the victim to vomit in the following cases.

- 1) When the victim is unconscious
- 2) When the mouth or throat is inflamed
- 3) When the accidentally ingested substance cannot be identified
- 4) Acids, alkalis 5) Gasoline, kerosene

Information is available from the Japan Poison Information Center (Osaka Poisoning 110: 072-727-2499, Tsukuba Poisoning 110: 029-852-9999) (not toll-free).

(3) If a victim inhales a large amount of vapor

Carry the victim to an area whose air is clean as quickly as possible, cover the body with a blanket, etc., and keep the body warm. Allow the victim to rest. Open the windows, etc. of the room where the accident occurred for ventilation (in cases other than fire).

(4) In the case of adhesion to the skin

Take the victim to an area where the skin can be cleaned as quickly as possible, and remove the contaminated clothes, shoes, etc. Subsequently, sufficiently clean the skin with running water (e.g., an emergency shower) and soap.

(5) If a chemical substance enters the eyes

Take the victim to an area where the eyes can be washed as quickly as possible. Open the eyelids with fingers and clean the eyes with running water for at least 15 minutes.

(6) If a victim does not have a pulse

An AED is used for a victim who is in a cardiopulmonary arrest and whose heartbeat does not restart after cardiopulmonary resuscitation (CPR). An electric shock is applied for defibrillation.

[Effectiveness]

It is important to perform defibrillation using an AED as soon as possible. The life-saving effect is considered to drop by 7% or 8% for each minute of delay in defibrillation. The prognosis of a victim depends largely on the quickness of the use of an AED.

[Usage]

- [1] Place the AED next to the victim at a position that does not obstruct the person who performs chest compressions.
- [2] Turn on the AED and follow the audio prompts. (Continue CPR even after arrival of the AED.)
 - 1) Attach electrode pads and connect cables.
 - 2) The electrocardiogram (ECG) signals are analyzed.
 - 3) Press the “shock” button upon a prompt to start defibrillation (electric shock). Take care to avoid an electric shock to yourself. Perform chest compressions upon a prompt that defibrillation is not required.
- [3] Resume CPR immediately with the electrode pads attached. ECG signals are analyzed two minutes later. If the victim regains consciousness or voluntary respiration is confirmed, discontinue chest compressions and observe the victim carefully.

* The AED arrangement plan can be checked on the website of the Kumamoto University Health Care Center (in Japanese, <http://hcc.kumamoto-u.ac.jp/>) → “健康相談 (Health Consultations)” → “健康の手引き (Health Guidance).”

2. Emergency measures

Emergency measures also include first-aid measures, but this section focuses on fire, explosion, and leakage attributed to chemical substances. When handling hazardous materials and toxic chemical substances, fire or explosion may occur due to ignition and inflammation. Such materials and substances may adhere to the body, clothes, etc. When toxic chemical substances are dropped, etc., they may spread over a table or floor. In these cases, it is important to take action properly to prevent the damage from spreading. For details of the method of taking action for respective chemical substances, make sure to refer to SDSs.

(1) Fire caused by ignition and inflammation

If a fire breaks out, let other people know about the fire in a loud voice without hesitation and call for support. Also call for a firefighting team and contact the gate house and the Accident Prevention Center. If there are injured persons, rescue them first. Next, start first-aid fire fighting using a fire extinguisher (powder: for ABC fires) and fire extinguishing sand (alkaline metal: for fires caused by potassium and sodium). It should be noted that first-aid fire fighting using a fire extinguisher and fire extinguishing sand is effective only to a certain extent. If the flame is as tall as a person, evacuate immediately. Avoid inhalation of smoke during evacuation.

[Notes]

- 1) In such cases, completely stop the experiment and the use of gas or fire to prevent a secondary accident.
- 2) In the event of a fire, close the windows of the room (to prevent the fire from spreading).
- 3) If the face is burned due to an explosion, etc., check whether nose hair has been singed. If nose hair is singed, the victim may have suffered respiratory burns. Take the victim to a hospital promptly.
- 4) If clothes catch fire, drop and roll to extinguish the fire. Or, roll the victim or use a piece of cloth or water, etc. to extinguish the fire.