



İZMİR INSTITUTE OF TECHNOLOGY

Chemistry Department

General Chemistry Laboratory Rules










(CHEM131, CHEM141, CHEM132, CHEM142)

Updated: February, 2024

When undertaking work with gaseous, liquid, or solid materials regarded as hazardous, as well as with those that form dust, you are obliged to follow special codes of behavior and observe particular protective regulations.

Substances of unknown hazardousness have to be handled as if they were hazardous materials. Hazardous materials can be taken in by inhalation through the lungs or absorption through the skin, the mucous membranes or the digestive tract.

According to the European CLP guideline dangerous goods will be labelled as

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|---|--|---|--|---|-------------------------------------|
|  | acute toxicity (higher categories) |  | acute toxicity, target organ toxicity (lower categories) skin/eye irritation skin sensitisation ozone layer depletion |  | dangerous for the environment |
|  | corrosive |  | compressed gases liquified gases dissolved gases |  | oxidizing |
|  | flammable (diff. levels) pyrophoric self-heating |  | CMR compounds target organ toxicity sensibilisation of the respiratory system aspiration hazard |  | explosive |

In addition, something is considered a dangerous good, if dangerous substances may be derived or be released, if they affect the health and the security of employees by their physical-chemical, chemical or toxic properties or if they have a threshold value.

Hazard statements (H statements) provide standardized information on product hazards while

precautionary statements (P statements) provide advice on how to correctly handle chemical substances and mixtures.

e.g. for Acetone

H225: Highly flammable liquid and vapour. H319: Causes serious eye irritation H336: May cause drowsiness or dizziness P210: Keep away from heat/sparks/open flames/hot surfaces – No smoking.

1. Basic Rules:

- 1.01 It is not allowed to enter any room, use any technical device or chemical without instruction. These are individually regulated by specific operating instructions.
- 1.02 The normal working hours, when occupational health-and-safety management is provided are your lab period.
- 1.03 Before handling hazardous materials, users have to make sure that they are aware of the risks and hazards of these materials.
- 1.04 Hazardous materials must not be kept or stored in containers which might lead to their being confused with foodstuffs.
- 1.05 Toxic and highly toxic materials are to be kept under lock and key.
- 1.06 Flammable solvents must only be kept in the laboratory in amounts necessary for the work in hand. Larger amounts have to be stored in the approved safety cabinets. Keep safety cabinets closed at all times.
- 1.07 Refrigerators and freezers for highly flammable substances must be explosion protected. These are marked by a sign. Storage time and quantities must be reduced to a minimum.
- 1.08 Substances from which hazardous mixtures with air can be formed when heated must not be placed in the drying oven.
- 1.09 All vessels have to be labelled with the name of the substance inside. The hazard pictogram and H-and P-statements of the chemicals that are used in the experiments must be known. Hazardous materials must not be kept in breakable vessels.
- 1.10 Inhalation of vapors and dusts as well as contact of hazardous materials with the skin and eyes is to be avoided at all costs. Therefore, they have to be handled in fume hoods. Their release has to be avoided by applying all reasonable measures.
- 1.11 In the laboratory, lab coat (max 35% polyester) and safety glasses have to be worn at all times. It is not advisable to wear contact lenses in the laboratory.
- 1.12 In the laboratory, functional clothing that minimizes the hazards caused by fire due to its fibres' properties has to be worn. Clothing has to cover arms, legs and ankles. Only sturdy, non-open footwear with firm grips may be worn.
- 1.13 Eating, drinking and storing food is not permitted in laboratories. Headphones are forbidden to use while working with or transporting hazardous substances.
- 1.14 Chemicals may only be used for scientific purposes in teaching, research and analytics. They must not be brought out of the Chemistry Institute.
- 1.15 Common disposable gloves only provide splash protection and can be used for operations where there is an acute risk of contamination to the hands. Due to the large number of different substances used in laboratories, the intactness of gloves cannot be guaranteed afterwards. They must therefore be removed after use. It is therefore forbidden to wear gloves when leaving the laboratories or when changing rooms. Opening doors with the lab coat as a barrier between the glove and the door handle is also not permitted due to the risk of contamination for the door handle and the outside of the coat.
- 1.16 Compressed gases may only be handled after instruction. Compressed gas cylinders must be secured against falling over. They may only be transported with the main valve closed, without pressure regulator, with a nut bolt screwed on, with a safety cap on the thread and secured on a trolley. If a gas cylinder is used permanently in the lab it has to be stored in a safety cabinet.

- 1.17 Electrical cables are to be laid so that they cannot cause a hazard. It is not permitted to connect multiple electrical socket outlets in series due to the possible loss of electrical safety and an increased fire hazard. Electrical sockets have to be protected against squirting liquids.

2. General protection and safety devices

- 2.01 The front of the fume hoods has to be kept shut. Defective fume hoods have to be reported to the management of the Institute and work can only continue after the fault has been rectified.
- 2.02 Make sure you are aware of the location of and procedures for operating the emergency switches for gas, electricity, water and ventilation. These may only be used in emergency and the management of the Institute has to be informed immediately.

3. Waste reduction and disposal

- 3.01 The amount of hazardous waste has to be minimized by not using more of any substance than necessary for a reaction. The safety data sheets and specific operating provide information on the disposal of waste.
- 3.02 Residues without further use classified as hazardous waste, have to be packaged, labelled and declared according to the relevant guidelines.
- 3.03 The following types of waste have to be collected separately:
- Organic solvents in 5 l-one-way plastic cans.
 - Solid waste in wide neck plastic containers or plastic barrels.
 - Heavy metals in acidic aqueous solution.
 - Sharp items (broken glass, cannulas of syringes etc.) in puncture proof containers.

4. Behavior in dangerous situations (e.g. fire, leakage of hazardous gases or liquids)

- 4.01 Keep calm, avoid overhasty and blindfold action. Self-protection takes precedence over personal protection over property protection.
- 4.02 Warn all people in risk, advise them to leave the building and help any injured persons.
- 4.03 Turn off experiments at risk, gas, electricity and water (cooling water must be left running.). Turn off heating baths and replace them with cooling baths if possible.
- 4.04 Supervisors and management must be notified immediately.
- 4.05 After accidents with hazardous materials that may cause long-term damage or that lead to indisposition or skin irritations, medical advice is to be sought Inform your supervisor, people responsible of the practical course or the practical course assistant. An accident-report sheet has to be completed by the safety management of the Institute as soon as possible.

5 Principles of First Aid

- 5.01 Always put your own safety first when administering help. Wear gloves. Call the emergency services as soon as possible.

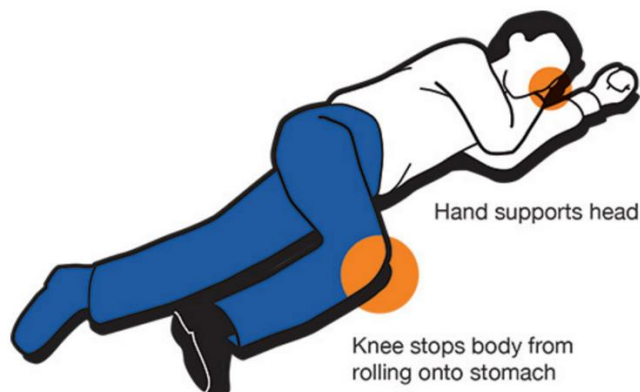
- 5.02 In case of inhalation: remove persons from areas where danger exists into the open air.
- 5.03 In case of burns: extinguish burning clothes by using the emergency showers, fire blankets or by rolling on the floor. Cool small burns for a long time with tolerably cold water. For larger burns, seek medical advice.
- 5.04 In case of contamination of the skin: use emergency showers, remove contaminated clothing, clean with plenty of water and soap; in case of poorly water-soluble substances, wash them off the skin with polyethylene glycol and rinse with water.
- 5.05 In case of contamination of the eyes: Rinse both eyes with eye wash from the outside to the root of the nose with opened eyelids for at least 15 minutes. If necessary, protect noncontaminated eye. Cover contaminated eyes sterilely and seek medical treatment.
- 5.06 If swallowed: Never induce vomiting. Give water to drink. Have material safety data sheets available and contact poison control center. Keep them on the line and pass on to doctor as soon as possible.
- 5.07 In case of injured people: Check and monitor respiration and circulation. Put an injured person in a position which minimizes movement and prevent loss of body heat. If conscious, place the casualty in the shock position: legs slightly (max. 10 cm) above heart level with the joints supported. Talk to the injured party encouragingly.



- 5.08 In case of unconsciousness: If the casualty is unconscious but breathing put them into the recovery position and stretch the head back. In case of respiratory arrest start resuscitation. Use a breathing tube and consider possible poisoning of the patient. In case of cardiac arrest: contact trained person for cardio-pulmonary resuscitation (CPR) (first aiders: see list).

The Recovery Position

Keep the Airway Clear



Stay with person. If you must leave them alone at any point, or if they are unconscious, put them in this position to keep airway clear and prevent choking.

- 5.09 In case of open wounds: Stop bleeding, dress wounds with bandages, ensure disposable gloves are worn.
- 5.10 In case there are doubts about the harmlessness of the accident: Call a doctor immediately. Do not leave injured persons alone until the emergency services arrive. Collate information for the doctor (information about chemicals and safety data sheet).

6 Behavior in case of fire

- 6.01 Keep calm. Self-protection takes precedence over personal protection over property protection.
- 6.02 If there is no automatic alarm: operate the nearest fire alarm (corridors and staircases, see plans).
- 6.03 If the danger cannot be assessed, close doors (do not lock them) and leave the building via the marked escape routes (see plans), warn those in danger and help injured persons where possible. Do not use elevators!
- 6.04 If circumstances permit and your own integrity can be guaranteed, take personal belongings (clothing, papers, keys, laboratory notebook) with you or extinguish the incipient fire with lab resources (fire extinguisher, sand, blanket).
- 6.05 Congregate in the car park in front of the building in order that any missing persons can be identified.

7. Emergency Calls

- 7.01 Make an emergency call (in case of fire or accidents: 112) according to the following scheme:

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|---|---------------------------------------|---|
| 1 | WHERE did the accident happen? | give location (address) |
| 2 | WHAT happened? | fire, caustic burn, collapse etc. |
| 3 | WHAT kind of injury? | type and location on the body |
| 4 | HOW MANY casualties? | |
| 5 | WAIT | never hang up before the control station terminates the call! There might still be important questions to answer. |

Report all accidents to the responsible member of the University's academic staff and management of the Institute.

7.02. Important phone numbers

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| Emergency number | 112 |
| Emergency Room IYTE | 0232 750 6222 |
| Nurse Station | 0232 750 6208 |

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| Chief of Security | 0232 750 6097 |
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| Department of Health, Culture and Sports | 0232 750 6200 |
| General Secretariat | 0232 750 6013-14 |
| Faculty of Science, Dean's Office | 0232 750 7500 |
| Dept. of Chemistry Secretariat | 0232 750 7522-23 |
| Dept. Of Molecular Biology and Genetics | 0232 750 7300 |

