

## **SAFETY RULES FOR WORK IN STUDENT LABORATORY 2017/18**

Work in a laboratory involves certain degree of risk: accidents can and do happen. Strict adherence to the following rules is essential for preventing – or minimizing – the effects of accidents.

- 1. Students are obliged to prepare for each practical lesson. They must read in advance the theory and instructions issued for each practical lesson and familiarize themselves with the meaning and underlying principles of the scheduled experiments before they start to work.**
- 2. Students pay full attention to all instructions, written or spoken, before and during experimental work in the student laboratory. No unauthorized experiments are allowed. In case of any unclear instruction student has to ask the instructor for further information.**
- 3. Entry to the laboratory is allowed only in presence of teacher or technicians. Likewise, leaving the laboratory during or after the experiments must be approved by the teacher.**
- 4. Coming late without previous notice, lack of discipline, ignorance or negligence of the safety rules or the scheduled experiments may lead to exclusion of the student from the practical lesson.**
- 5. Persons whose attention or cognitive abilities are impaired, e.g. by medical condition, the influence of alcohol or any other psychotropic substances, are forbidden to enter and stay in the laboratory.**
- 6. Eating, drinking and smoking in the laboratory is strictly forbidden. Bringing food and beverages to the laboratory is not allowed either.**
- 7. Every student should wash hands before leaving the laboratory.**
- 8. Students must use adequate footwear for the laboratory and always wear a laboratory coat, which must be kept button-down. Students are also obliged to wear protective glasses during the laboratory lessons.**
- 9. It is forbidden to enter the laboratory with contact lenses on the eyes. Long hair must be kept bound, and rings removed from hands.**
- 10. Women in any stage of pregnancy and mothers until the end of 3<sup>rd</sup> month after delivery are not allowed to enter a chemical laboratory. The same applies to any persons whose health condition could be threatened by stay in the laboratory, used reagents or biological material.**
- 11. Every student works at his/her working place, where he/she is obliged to keep everything clean and in order. Every student is responsible for the condition of used equipment and reagents. Any loss or damage must be immediately reported to the teacher or technician.**
- 12. Any heated or chemically contaminated tools can only be put aside on a specified place. When laying the reagent bottle stoppers on the bench, care must be taken to avoid contamination of the bench with the reagent. Any reagent bottle should be returned to its place immediately after use.**
- 13. It is forbidden to place flammables and any other reactive or potentially reactive material into the cupboards, unless explicitly stated in the instructions.**
- 14. In case of spillage or leakage of any reagent or biological material or any other unexpected event, every student is obliged to perform all possible measures to minimize harm to human health, equipment or environment, and notify the instructor immediately.**
- 15. In case of spillage of a flammable liquid, gas burners must be immediately put out, the room ventilated, and the flammable substance removed by absorption into a suitable porous material, which is then disposed as a dangerous waste.**
- 16. Spilled acid is immediately diluted with water, and washed out with water or removed by absorption into an inert material. Likewise, spilled alkali is washed out with water or removed by absorption into an inert material, and disposed as a dangerous waste.**
- 17. Any other spilled substances are disposed according to instructions of your teacher. Unless specific rules are given, the spilled substances can usually be swept or absorbed into a porous material, and disposed as a dangerous waste. The dirty place or equipment is carefully washed with water.**

18. Glass fragments and any other trash with sharp edges must be disposed into cans marked and designated for this purpose.
19. For work with concentrated solutions of acids, alkali and some organic solvents the plastic shields are used for eyes and face protection. Corrective eyeglasses or protective glasses are not adequate substitute.
20. For work with biological material and some hazardous substances the single-use latex gloves are used. Contaminated gloves should be changed immediately.
21. Mouth pipetting is generally forbidden. A bulb or pump must always be used to draw liquids into a glass pipette.
22. Any work with fuming and irritating substances, in specific cases with other hazardous substances as well, is restricted to the operating fume chamber.
23. Sensory tests for gaseous reaction products are performed by wafting the odor to the nose by a hand movement above the container. Any straight inhalation of toxic gases must be avoided.
24. A great care is needed for any work with gas burner and objects (tubes, asbestos grid etc.) that have been heated. It is forbidden to leave any burner flame unattended. If the flame jumps into the burner, or suddenly goes out, it is necessary to close the gas inlet immediately, wait till the burner cools down, and readjust it. It is generally forbidden to subject flammable substances to heat generated by any means.
25. When heating and observing a sample in a test tube, the tube orifice must always be directed out from the student's face, as well as faces of any other persons around.
26. All solutions and chemicals must be disposed as instructed. Solutions that can be disposed to the sink must always be thoroughly diluted: aqueous acids or alkali about 1:30, other solutions miscible with water about 1:10.  
  
Hazardous substances that cannot be discharged into the sink, are disposed as dangerous waste according to instructions given by the teacher.
27. In case of any injury every student is obliged to provide an adequate first aid and notify the teacher or technician immediately.
28. Students are generally not allowed to perform any manipulations with electrical appliances except for those explicitly stated by the instructions. It is forbidden to plug in any unapproved appliances in the laboratory.
29. Students are obliged to respect any safety markings and pictograms on the equipment, tools and reagents.
30. Any student who finds or suspects a damage to the laboratory equipment that may threaten health and safety of laboratory workers, such as gas leakage, damaged insulation of electrical cord, penetration of liquid into electric sockets and appliances etc., is obliged to report the condition immediately to the teacher or technician, and in case of emergency to provide measures on his/her own that would minimize the damage.
31. After finishing the experiments every student is supposed to clean his/her working place, rinse used glassware and put all tools to their appropriate places. Only if the teacher or technician checks the working place and finds it in an acceptable condition, the student is allowed to leave.

## ***First Aid in Laboratory Accidents***

### **Chemicals in the eye**

If any reagent or biological material enters the eye, immediately (!) wash the affected eye with plenty of tap water. The teacher will decide on further treatment. No neutralizing solutions or eye drops are used in the first aid.

### **Corrosion of the skin**

Remove the stained clothes, and wash with plenty of tap water. In case of severe burns the teacher will provide further treatment.

### **Burns**

As soon as possible cool the affected area of the skin with a lot of cold tap water. The teacher will provide further treatment.

### **Open wound**

Stop bleeding and prevent wound infection. Small wounds, e.g. cuts by pieces of glass are washed with stream of water; further treatment, including disinfection and sterile cover, is provided by the teacher. Do not try to remove foreign bodies in the wound, such as glass shivers, during the first aid.

### **Inhalation of harmful substances**

Move the victim to fresh air, loosen his/her clothes, and start resuscitation if necessary. The teacher will provide further treatment.

### **Ingestion of harmful substances**

Immediately inform the teacher who will provide further treatment.










## Hazard pictograms on the reagents

Dangerous chemicals in original containers are labeled with warning statements and symbols according to **Globally Harmonized System of Classification and Labeling of Chemicals (GHS)**. If technical conditions allow, the same labeling or its simplified version can be used in a student laboratory as well.

The GHS labeling includes:

- Hazard pictograms (see below)
- Signal words **danger** (high risk) or **warning** (lower risk)
- **Hazard statements** that specify what are the risks associated with usage of the substance
- **Precautionary statements** that indicate how the substance should be handled safely

There are nine hazard pictograms in use. The following table shows their simplified description:

	<b>Flammable.</b> Substances that are easy to ignite, can burn upon heating or due to a spontaneous reaction. Also substances and mixtures that can spontaneously generate heat; that can ignite when in contact with air; or that produce flammable gases when combined with water.
	<b>Oxidizing.</b> Substances that are not themselves flammable but can react with flammable substances and cause or augment their fire or explosion.
	<b>Toxic.</b> Ingestion of a small quantity, in some cases dermal or inhalation exposure can cause acute damage to health or death.
	<b>Corrosive.</b> Cause severe skin burns and eye damage.
	<b>Health hazard.</b> Used e.g. for substances that act as carcinogens, teratogens or mutagens, cause specific target organ damage or allergies.
	<b>Irritant.</b> E.g. substances causing skin, eye, or respiratory tract irritation, also narcotic substances and substances with other harmful effects on health. The symbol is also used for compounds that destroy the atmospheric ozone layer.
	<b>Environmentally damaging.</b> Especially substances that pose hazards to aquatic environment.
	<b>Explosive.</b>
	<b>Compressed gas.</b>