Institut für Chemische Technologie von Materialien
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Regulations for Occupational Safety at ICTM

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This document is a translation and is provided for information purposes only. In the event of any inconsistency between the German version and the English version, only the German version is to be considered.

General principles

1.00 Students are permitted to stay in the laboratory area (workshops and laboratories) of the institute only in the context of courses, internships or diploma theses or by appointment in the designated areas. Specially marked areas with increased safety requirements may not be accessed.

1.01 No food or drinks are permitted in the laboratory or in the stockroom. The building is completely non-smoking.

1.02 Chemical substances must not be stored in flasks, which could cause confusion with foods.

1.03 Persons affected by addictive substances (alcohol or other drugs) or medication must not enter the laboratory area.

1.04 The stay in the laboratory area is only allowed during working hours (Mon - Fri: 8 – 18 h) or after consultation with the supervisor. At all times it is forbidden to work alone in the laboratory. The presence of a second person requires that person to be within calling distance and be able to provide assistance in the event of an accident.

1.05 Safety glasses have to be worn in the laboratories. Spectacle wearer should use overglasses or optically corrected safety glasses.

1.06 Appropriate protection gear (closed coat, safety glasses, gloves, closed/sturdy shoes) has to be worn while working in the laboratories. The clothing should cover the body and the arms sufficiently and has to consist of a material, which does not increase the danger of fire due to its melting behaviour. Further safety precautions can be taken from the safety data sheets and the operating instructions, which must be read before starting work.

1.07 Generally, all work is subject to approval. Devices, machines and systems may only be used after agreement and training by an institute employee. Appropriate protective measures (safety glasses, shielding etc.) must be worn if radiation (UV, laser light, ionizing radiation) or electro-hazards can occur. Machines in which a risk of crushing and trapping exists (the rolling mill, the laboratory kneader, the piston injection machine) may never be operated alone, but only in the presence of a second person.

1.08 While working with chemicals the Hazards (H) and Precautionary (P) -phrases must be known, observed and the corresponding protective measures taken (protective equipment, extinguishing agents, neutralizing agents etc.).

1.09 Very toxic and toxic substances are to be kept under lock and key.

1.10 All standing flasks must be labeled with the name of the substance and the GHS pictograms; Vessels (from 250 mL) must be labeled completely, *i*. *e*. H- and P-phrases as well. Vessels with permanent labeling (*e*. *g*. wash bottles for distilled water or ethanol) must not be used for other substances. The permanent labeling on these containers must not be overwritten or pasted over.

1.11 The inhalation of vapors and dusts as well as the contact of hazardous substances with the skin and eyes should be avoided. When handling gaseous, dust-like or hazardous substances it is essential to work in the laboratory hood.

1.12 Chemical reactions must always be carried out in the laboratory hood and have to be labeled (see template "Running Experiment"). When setting up an apparatus, all connections are to be secured. All apparatus have to be switched off in the evening. This also applies to hotplates, thermostats, cooling water and gas supplies. Only experiments which will not use or produce any toxic, harmful or foul-smelling substances may be carried out on the laboratory bench.

1.13 If apparatus exceptionally run overnight or for several days, a clearly visible labeling has to be affixed containing the type of reaction, the chemicals used, and a contact person with telephone number (see template "Night Experiment").

1.14 Precautions against electrostatic charging and sparking are to be taken when handling flammable substances. Ignition sources (hot surfaces, open flames) in the vicinity have to be removed. When working with flammable substances, **suitable** extinguishing agents should be provided.

1.15 When working with pressure vessels, gas fittings and evacuated vessels, safety measures must be taken in case of explosions or implosions (protective shield, shatter protection, suitable protective clothing etc.)

1.16 Each experiment as well as any activity on a device must be carried out thoroughly so that no damage occurs (body, clothing, equipment etc.). In case of damage, the supervisor must be informed immediately. It is explicitly pointed out that the Federal Government of Austria and Graz University of Technology are not liable for damages. Therefore, the conclusion of a third-party-insurance is recommended (Note: Included in the ÖH contribution for students).

1.17 Facilities required for the construction or operation of an experiment (infrastructure, machinery, measuring instruments etc.) may only be used after consultation with the supervisor. This includes parts that are used in other experiments, and in particular the metrological infrastructure of the institute.

Protection and safety devices

2.01 Persons working in the laboratory area are required to inform oneself about the existing fire protection and safety equipment as well as the emergency escape routes.

2.02 The front sash of the laboratory hood is to be kept closed. The functionality of the laboratory hood must be checked (*e*. *g*. by a wool strand). Defective hoods must not be used and must be reported immediately (to *Gebäude & Technik* personnel).

2.03 For safety reasons and to minimize fire hazard, the amount of chemicals and solvents must be kept as low as possible. Toxic chemicals should be stored in an appropriate lockable chemical cabinet. Not directly required chemicals and solvents are to be stored in the storage room. Laboratory hoods are no chemical storage.

2.04 Doors should be closed. In particular, fire doors must not be tied or fixed with a wedge. Entrance doors to the laboratory area have to be locked after office hours.

2.05 At all times the compressed gas cylinders have to be secured in the laboratory against overturning. They are to be stored in a compressed gas cylinder cabinet or in the gas storage.

2.06 Liquid nitrogen may only be filled by trained persons. A sufficient ventilation is required. Contact with eyes and skin as well as the inhalation of gas/vapour should be avoided. Cryogenic gloves, safety spectacles and sturdy shoes have to be worn. Clothing or shoes that have been contaminated with large amounts of liquid nitrogen should be removed immediately.

Only clean and suitable Dewar flasks are permitted to use for filling. A supervisor must be present during the filling process. Before opening, the Dewar container has to be vented to remove any residual pressure. It is prohibited to leave vessels with liquid nitrogen open at any time and containers must be secured against overturning. The safety data sheets and operating instructions for the handling of cryogenic liquefied gases are to be observed.

2.07 The lifts in the side entrances (blue and green stairway) are only permitted for passenger transport. The transport of pressurized gas cylinders and containers with liquid nitrogen must be carried out without passengers in the load lift (central/red stairway) and has to be accomplished as a special trip (key at Birgit Ehmann/Z5). Compressed gas cylinders may only be transported with the safety cap screwed on (without pressure reducer) and must be secured against overturning.

2.08 The transport of chemicals and equipment has to be performed as well in the load lift in the central (red) staircase. Suitable containers such as buckets, trays or suitable transport trolleys have to be used for the transport of the chemicals.

2.09 The amount of hazardous waste should be reduced by using only small quantities of the required substances. Further use and reprocessing are preferable to disposal. Reactive residues, *e*. *g*. alkali metals, peroxides and substances (solids/liquids), which develop gas, should be transformed into less hazardous substances. Non-reusable residuals classified as hazardous waste must be collected in the appropriate containers in accordance with the operating instructions or the instructions given by the supervisor.

2.10 To avoid stab wounds hypodermic needles should be collected properly after use without putting on the protective cap. The needles may only be used once and have to be placed in a puncture proof container.

2.11 All observations on potential risks in the institute are to be reported immediately to the institute board.

2.12 The fire risks must be minimized. Cartons, packaging material etc. have to be removed as soon as possible from the laboratory area.

Behaviour in case of danger

If a dangerous situation occurs, *e*. *g*. fire, leakage of gaseous pollutants or hazardous fluids, follow these instructions:

3.01 Keep calm and avoid hasty, precipitated action.

3.02 In case of fire, the common guidelines have to be observed:
Alert - Escape – Extinguish
The instructions of the supervisors (laboratory supervisor, fire protection attendant) have to be followed immediately. In the event of an evacuation alarm (siren), the building must be left instantly. The assembly point is located at the Münzgrabenstraße (south side) or next to the hydraulic building (east side). The use of the lift is forbidden in case of fire.

3.03 Warn endangered persons, if necessary, request them to leave the building.

3.04 If possible, switch off experiments, gas, electricity and water (Exception! cooling water must be left flowing).

3.05 Supervisor and institute board are to be informed.

3.06 In the event of accidents involving hazardous substances which may cause long-term damage or which have already led to discomfort or skin reactions, seek medical advice. All accidents, even of minor extent, the burst of fire, even if it has already been extinguished, must be reported to the institute board.

Basic rules of first aid

Pay attention to your <u>own safety</u> during all assistance.

4.01 The emergency call (144) should be made as soon as possible.

<u>The emergency call</u>		Where?
Emergency medical service	**144**	What?
Police	**133**	How many?
Fire Brigade	**122**	Who is calling?

4.02 Persons have to be rescued from the danger zone, taken to the open air and supervised for injuries until the emergency medical service arrives.

4.03 Extinguish burning clothing.

4.04 Use the emergency showers: Remove clothing soaked with chemicals and clean yourself with water and soap.

4.05 In case of corrosive injury of the eye, purge both eyes from the outside to the root of the nose with the eye douche for at least 10 minutes

4.06 Address the victim. If there is no reaction, shake gently by the shoulder. If the person reacts: leave him/her in a safe position and make an emergency call. Regular control of the condition until the rescue workers are on site.

If the person is unresponsive: Overstretching the head, hearing, seeing, feeling if the person breathes. Place **unconscious persons with existing respiration** in a recovery position. If not already done, make an emergency call and continue to monitor the breathing.

If **no normal respiration is visible**, immediately make an emergency call. If a defibrillator is available: Follow the instructions of the defibrillator. In the meantime, start with the reanimation. In order to do this, press approx. 5 cm deep in the middle of the chest 100 – 120 times per minute. Relieve the thorax after each compression. After 30 compressions, give artificial respiration twice with head extended (mouth-to-nose or mouth-to-mouth). Afterwards again cardiac massage.

4.07 Quench heavy bleeding with pressure bandage, using disposable gloves.

4.08 The physician has to be informed about the chemicals used: the safety data sheet should be provided.

4.10 Personal protection precedes property protection.

Univ.-Prof. Dr. Martin Wilkening
Institutsvorstand / Head of the Institute

a.o. Univ.-Prof. Dr. Klaus Reichmann
Sicherheitsbeauftragter / Safety Commissioner

Graz,

With the signature it is confirmed that the regulations have been read and understood.