Operating Instructions for Laboratories (Laborordnung) at the Institut für Physikalische Chemie der WWU Münster

INTRODUCTORY REMARKS

Working Place:	Laboratories for Research and Practical Courses Institut für Physikalische Chemie
Kind of Work:	General Laboratory Work
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Date of last changes: 29.1.2010

When undertaking work with gaseous, liquid or solid materials regarded as hazardous, as well as with those that form dusts, you must follow special codes of behaviour and 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.

Hazardous materials are substances or preparations

- which are

very toxic (T+) 	*explosive (E)* 	*flammable (R10)*
toxic (T) 	*oxidizing (O)* 	*carcinogenic*
harmful (Xn) 	*extremely flammable (F+)* 	*teratogenic*
corrosive (C) 	*highly flammable (F)* 	*mutagenic*
irritating (Xi) 	*dangerous for the environment (N)* 	*sensitizing*

- or have other chronically harmful properties
- or from which dangerous or explosive substances or preparations may be derived or be released.

During all work you must follow the guidelines listed below.

1 BASIC RULES

1.1 Without having received a safety instruction you are not allowed to enter any laboratory, use any technical devices or chemicals. The use of laboratories, technical devices and chemicals is regulated by specific operating instructions. Before starting any work and then at least once per year the supervisor must instruct all of his coworkers about general and special dangers at the working place and how to deal with them.

1.2 The normal working hours are Monday through Friday, 7:00 h to 18:00 h. Working alone is permitted only if it is deskwork (e.g. computer work). Performing laboratory work is permitted only if a second person is within calling distance. Special rules apply when working outside of the normal working hours and at holydays. More details are given in the Rules of the House (“Hausordnung”).

1.3 Eating, drinking and smoking are not permitted in the laboratory.

1.4 Work under the influence of alcohol or other drugs is prohibited at the complete institute.

1.5 Before handling hazardous materials the user has to make sure that he / she is aware of the risks and hazards of these materials by using chemical catalogues, safety data sheets.

The established specific hazards (“R-Phrases”) and pieces of advice concerning safety (“S-Phrases”) are an integral and binding part of these operating instructions.

1.6 Hazardous materials must not be kept or stored in containers which might be confused with food containers.

1.7 Toxic and highly toxic materials must be kept under custody. If there is no possibility to lock away these materials, the laboratory has to be locked upon leaving so that no unauthorized person has access to it. (Responsibility for organization: Supervisor of the group or of the practical course.)

1.8 Flammable solvents as well as flammable and highly flammable materials may only be kept in refrigerators or deep cooling devices with explosion-proof interiors. Such refrigerators are labelled with a blue sign (“Zur Aufbewahrung brennbarer Flüssigkeiten geeignet”). Before buying a refrigerator which does not have an explosion-proof interior, the mechanical workshop must be contacted first in order to guarantee that the freezer can be modified afterwards to meet the requirements. Hazardous materials may only be kept in refrigerators and deep freezers in amounts which are necessary for the work at hand. Cooling devices must not be misused as stores for hazardous materials, e.g. flammable solvents. Flasks on cork rings are not allowed in refrigerators, for this would allow them to tip over easily. Instead, flasks must be put into beakers.

1.9 If substances which can form hazardous, explosive atmospheres have to be dried in a drying oven, protective measures against explosion must be taken.

1.10 Every laboratory storage container has to be labelled with the name of the substance and the hazard symbol, large vessels (>1 Liter) have to be fully labelled, including the R- and S-Phrases. Hazardous materials, especially flammable liquids, must not be kept in breakable vessels >1 Liter. For the transport of hazardous materials in breakable vessels a container has to be used.

1.11 Flammable solvents can only be kept in the laboratory in amounts necessary for the work at hand. Larger amounts of solvents have to be stored in the designated, approved safety cabinets. The limits according to “VbF/TRbF 20” (Ordinance on flammable liquids) have to be always complied with.

1.12 Avoid inhalation of vapours and dusts as well as contact of hazardous materials with the skin and eyes. Hazardous gases and dusts as well as hazardous materials with high vapour pressures have to be handled in fume hoods. According to the “Gefahrstoffverordnung” (Ordinance on hazardous materials) all reasonable measures have to be taken to avoid a release of hazardous material.

1.13 In a laboratory, safety glasses must always be worn. Spectacle wearers have to wear safety glasses with corrective lenses. Alternatively, spectacle wearers may wear supplementary safety glasses over their own glasses (“overspecs”). These must conform to W DIN 2.

1.14 In the laboratory functional clothing has to be worn, e.g. a cotton lab coat. This minimizes the hazards caused by fire, which may cause fibres to burn or melt. Clothing has to cover body and arms sufficiently. Only sturdy, non-open footwear with firm grips may be worn. For all members of the Institut für Physikalische Chemie working in permanent or non-permanent positions, cotton lab coats can be ordered. Others, e.g. students or guests can borrow a lab coat during their stay at the institute. The general rule is: Functional protective clothing has to be worn!

1.15 Personal protective equipment – as prescribed by the S-Phrases and specific operating instructions – like basket glasses (goggles), facial protective shields and special gloves have to be used. Toxic, highly toxic and corrosive compressed gases may only be handled after instruction. Respiratory devices with appropriate filters have to be kept close to the working place.

1.16 Women working with hazardous materials must report a pregnancy to the management of the Institute or their group leader immediately.

1.17 Read the following scripts and follow the instructions

- Richtlinien für Laboratorien
  (Guidelines for laboratories)

  GUV-Regeln: Laboratorien
  (*http://regelwerk.unfallkassen.de/daten/regeln/R_120.pdf*)
  and TRGS 526 (*http://www.baua.de/nn_16744/de/Themen-von-A-Z/Gefahrstoffe/TRGS/pdf/TRGS-526.pdf*)

- Die allgemeine Unfallverhütungsvorschriften (BGV A1 bzw. VBG 1)
  (General accident prevention regulation)
  see *http://www.uni-muenster.de/Rektorat/Sicherheit/stwv/stwv_0u.htm#U*

- Sicherheitsfibel der Westfälischen Wilhelms-Universität Münster)
  (Safety script of the WWU)
  http://www.uni-muenster.de/Rektorat/Sicherheit/org/org_inx.htm#SF

- Entsorgungsordnung für Sonderabfälle
  (Instruction for the Disposal of Chemicals)

http://www.uni-muenster.de/Rektorat/Sicherheit/sa/es/es_inx.htm

- die Brandschutzordnung der Westfälischen Wilhelms-Universität Münster
  (Fire protection regulation of the WWU)
  http://www.uni-muenster.de/Rektorat/Sicherheit/brs/brs_inx.htm

- die Hausordnung des Instituts für Physikalische Chemie
  (Rules of the house)

- as well as further specific operating instructions for hazardous materials and technical devices.

1.18 Continuous and overnight experiments have to be labelled with a sheet of paper which contains at least the following information:

- Kinds of chemicals involved and products formed thereof with correct labels of possible hazards.
- Temperature of the reaction and information about the necessity of cooling
- Person to contact and telephone number
- What has to be done if problems occur (e.g. loss of cooling liquid) and in cases of danger (e.g. fire)?

An experimentalist has to make sure for all kinds of experiments with automated temperature control running in his or her absence that no damage to property or persons will happen in case that the temperature control fails.

2 GENERAL PROTECTION AND SAFETY DEVICES

2.1 The front sliding panels of the fume hoods must be kept shut. The suction of the hoods which are not automatically monitored has to be checked differently, e.g. by a strip of paper or a cotton thread hung in front of the ventilation opening. Do not use a malfunctioning fume hood! If a hood is not working properly report this immediately to one of the janitors (Mr. Heßling: 0176 18300 314 / Mr. Piotrowski: 0176 18300 052) or to one of the curators (Dr. Steif: 8323422 / Dr. Faust: 0176 18300 266) or to the safety engineer Mrs. J. Dorstewitz 0176 18300 150.

2.2 Make sure that you are aware of the location of and procedures for operating the emergency isolation switches for gas, electricity and water. Intervention into one of devices for gas, electricity, water and ventilation is only allowed to personal of the “Technische Dienste”. In cases of acute danger, a malfunction has first to be reported to the “Störungsannahme” (Tel. 33333). In addition, you should inform one of the persons listed in 2.1. If there is no acute danger, one of the persons listed in 2.1 should be contacted. If an isolation switch has been pressed accidentally, one of the janitors should be informed about this immediately.

2.3 Emergency showers and eye washes have to be checked monthly. The emergency showers are checked by Mr. Heßling. The eye washes have to be checked by a nominated person assigned by the person in charge of the laboratories (group leader or leader of the practical exercise). The results of the tests must be reported in a report book.

2.4 Fire extinguishers, containers of extinguishing agents and containers of absorbent materials have to be refilled after every use. Used fire extinguishers and those with broken seals have to be handed over the janitor. If sand for extinguishing fire is needed, please contact one of the janitors.

2.5 Drains at floor level and basin siphons have to be kept filled with water so that the sewerage pipes are kept sealed off from the low pressure in the laboratories in order to avoid possible bad smell.

2.6 First-aid kits are provided in central locations in every working group – make sure you know where they are. First-aid kits are checked regularly by H Feldhues, J. Dorstewitz and by some assigned first-aider. The contents are replenished if necessary. Any removal from the First Aid-kit has to be noted down in the "Verbandbuch".

2.7 In the event of an accident inform Dr. Steif immediately. In addition, an accident report has to be written by the supervisor which has to be sent to the University administration and the Landesunfallkasse (LUK). A copy of this report has to be sent to Dr. Steif, PD Dr. Cramer-Kellers and Julia Dorstewitz.

3 DIMINUTION AND DISPOSAL OF WASTE

3.1 The amount of hazardous waste has to be minimized by not using any substance in quantities greater than is necessary for a reaction. Processing and recycling (e.g. of solvents) have priority over disposal. Reactive residues such as alkali metals, peroxides, hydrides or Raney-nickel have to be converted, as appropriate, into less hazardous materials directly after use. The safety data sheets provide information on the disposal of waste.

3.2 Residues which have no further use and which have to be classified as hazardous waste have to be packaged, labelled and declared according to the relevant guidelines ("Entsorgungsordnung für Sonderabfälle"). The legal regulations regarding transport must be followed. Never pour hazardous materials into the sink! Contact persons concerning disposals of chemicals are Mr. Hölscher (33130) and Mrs. Höing (23420).

4 BEHAVIOUR IN DANGEROUS SITUATIONS

In dangerous situations such as fire, release of hazardous materials and leaking of hazardous liquids the following instructions have to be followed:

4.1 Keep calm, avoid overhasty and blindfold action.

4.2 Warn all persons at risk, give the order to leave the building and give aid to any injured persons.

4.3 Turn off experiments at risk, gas, electricity and water (with the exception of cooling water which must be left running.)

4.4 Inform the supervisor and/or the responsible leader of the working group immediately.

4.1 After accidents with hazardous materials that may cause long-term damage or that lead to indisposition or skin irritations, seek medical advice immediately. Inform the supervisor or the leader of the practical course and Kustos Dr. Steif so that an accident-report can be written as soon as possible. The accident-report has to be sent to the Personaldezernat (Dez. 3.2). For accidents with 3 or more injured persons or for accidents with loss of life, the department Arbeits- und Umweltschutz has to be informed in advance by telephone.

4.5 Follow the instructions on the Emergency Action Plan.

5 PRICIPLES OF FIRST AID

5.1 Always put your own safety first when giving help to others! Call the **emergency services (112)** immediately. Cry for additional help if necessary.

5.2 Remove persons from danger zones and bring them into the open air.

5.3 Clothes on fire can be extinguished by using the emergency showers, fire blankets or by rolling the person on the floor.

5.4 In case of contamination with chemicals use the showers available on every floor; remove clothes contaminated by chemicals, undress completely if necessary. Wash with soap and water, wash non-water soluble substances with polyethylene glycol 400, and rinse with water thoroughly.

5.5 In the case of caustic burns in the eyes rinse with a gentle, arcing jet of water (i.e. the eye-wash stands or the hoses attached to each water tap), with the eye lids held back washing from the nose side to the outside corner of the eye for at least 15 minutes.

5.6 Check and monitor respiration and circulation.

5.7 If conscious place the injured person in the shock position: legs slightly (max. 10 cm) above heart level with the joints supported. Talk to the injured party encouragingly.

5.8 If the injured person is *unconscious* stretch the head back and check respiration. If the person *is breathing* put him/her into the *recovery position* while always keeping the head stretched back and checking the respiration. If the person is *unconscious and not breathing* start *cardio-pulmonary resuscitation* (CPR) as trained in First Aid Courses. Training courses in First Aid are also offered by the university. When doing the pulmonary resuscitation avoid possible contaminations with poisons.

5.9 Stop bleeding, dress wounds with bandages, ensuring disposable gloves are worn. Call the emergency services immediately. Do not leave injured persons alone until the emergency services arrive.

5.10 Collect information for the doctor: specifications of the chemicals with references to the special instructions for chemicals (stoffbezogene Betriebsanweisungen) and safety sheets (Sicherheitsdatenblätter). Retain any vomit and chemicals. Never induce vomiting if corrosive substances have been swallowed.

6 EMERGENCY CALL

Fire/Accidents **112**

Make an **emergency call** according to the following scheme:

WHERE did the accident happen?	Location (address)
WHAT happened?	Fire, caustic burn, collapse etc.
WHAT kinds of injury?	Type and location on the body
HOW MANY casualties?	Number
WAIT!	**Never ring off** before the control station terminates the call! There still might be important questions to answer.
WHO is calling?	Leave your name

Report all accidents to Kustos Dr. Steif (23422)

7 IMPORTANT TELEPHONE NUMBERS

In acute dangers always call: **112**

In non-acute dangers:

Ophthalmic Clinic:	5 60 04
Chirurgical Clinic:	5 63 04
Dermal Clinic:	5 65 04
Accident Surgery:	5 63 37
Central Clinic (East):	4 80 01 or 4 80 19
Central Clinic 8West):	4 80 02 or 4 80 20

List of all university clinics:
http://www.klinikum.uni-muenster.de/krankenversorgung/klinikenundinstitute/klinikenundinstitutederkrankenversorgung/index.php

8 BEHAVIOUR IN CASE OF FIRE

8.1 Fire Alarm: Acoustic signal
If you hear the alarm signal, you must leave the building immediately!

8.2 Do not panic.

8.3 Only attempt to extinguish small developing fires (fire extinguisher, sand, fire blanket), do not put any risk on yourself.

8.4 If the fire is not detected automatically, operate the next fire alarm-activation point (located in corridors and stairwells – consult the plans of the building).

8.5 Warn persons who are in danger, give assistance to those in need.

8.6 If possible try to leave your working place safely (e.g. by interrupting gas flows or electrical power). Close the doors behind you, but do not lock them. Leave the building immediately following the marked escape routes (see plans of the building). Do not use the elevators / lifts.

8.7 Meet at the gathering place so that any missing persons can be identified. Do not block the ways to the building and the entrances

ALWAYS REMEMBER PERSONAL SAFETY COMES FIRST

9 INTERNET ADDRESS

This text is also available as a pdf-File from the following web-page:
http://www.uni-muenster.de/Chemie.pc/organisation/sicherheit.html