University of Chemistry and Technology, Prague	
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Prepared by	972 – Department of Safety and Risk Prevention
Issued by	Prof. Ing. Milan Pospíšil, CSc. – Rector

Article I

Introductory provisions

1) This Directive sets out rules for a safe operation of laboratories at the University of Chemistry and Technology, Prague (hereinafter as 'UCT Prague', or 'university') in order to prevent injuries and other extraordinary operating events in laboratories (eg leaks of hazardous substances to the environment, damage to property etc).
2) For the purposes of this Directive, the term 'laboratory' refers to:
   - Chemistry laboratories that are primarily intended for carrying out laboratory work within the framework of scientific or research activities that include chemical experiments, syntheses or analyses or other similar activities that are dominantly based on using chemical substances or chemical mixtures. Activities carried out in a chemistry laboratory are not characterised by repetitive or constant processes as the actual essence of research and experimental development goes against this type of work.
   - Instrumental laboratories that are intended primarily for research, analytical, testing and forensic activities, for the development and testing of functional samples, verified technologies or pilot operations, or the measurement of various physical or chemical quantities using instrumental methods and apparatuses and where only a minimal amount of laboratory work based on using chemical substances or chemical mixtures is carried out (or no laboratory work is carried out in them).

- School (student) laboratories that are primarily intended for the instruction of students in accordance with educational programmes and schedules, while laboratory work within the framework of student research activity or preparation of Bachelor's and Master's theses may also be carried out in them. Activities carried out in school laboratories usually include repetitive processes (such as practicals). They can be both chemical and instrumental in their focus.

3) The term 'laboratory work' refers to all work with chemical substances and chemical mixtures carried out in a predefined way in laboratory conditions (see Art. 3.8, CSN 01 8003), or related activities carried out within the area of a laboratory unit, such as preparation of experiments, using technical equipment, taking measurements etc).

4) The term 'low boiling point flammable liquid' refers to a flammable liquid with the flash point below 0 °C and the boiling point below 35 °C under standard conditions.

5) The term 'precursor' refers to a selected chemical substance that can be abused for illicit production of home-made explosives and that is at the same time listed on the List of Substances Considered Explosives Precursors (see Annexes I and II to Regulation (EU) 2019/1148).

6) This Directive has been prepared in compliance with:

- Act No. 262/2006 Coll., the Labour Code, as amended (hereinafter also as 'LC').
- Act No. 309/2006 Coll., stipulating further requirements for health and safety at work in labour relations and concerning occupational health, as amended (hereinafter also as 'HSWA').
- Act No. 258/2000 Coll., on the Protection of Public Health, as amended (hereinafter also as 'PPHA').
- Act No. 133/1985 Coll., on Fire Protection, as amended (hereinafter also as 'FPA').
- Act No. 263/2016 Coll., the Atomic Act, as amended (hereinafter also as 'AA').
- Decree No. 180/2015 Coll., regarding prohibited jobs and workplaces, as amended.
- Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures … (hereinafter also as ' CLP').
- Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals … (hereinafter also as 'REACH').
- Regulation (EU) 2019/1148 of the European Parliament and of the Council of 20 June 2019 on the marketing and use of explosives precursors … hereinafter also as 'Regulation (EU) 2019/1148').
- CSN 65 0201 Flammable Liquids - Production, processing and stocking areas.
- CSN 01 8003 Safety code for working in chemistry laboratories.
- Valid internal regulations of UCT Prague of ensuring safety.

Article II

Scope of authority

This Directive is binding for employees and students at UCT Prague, participants in life-long learning courses and, to a reasonable extent, for other persons that are present in UCT Prague laboratories with the knowledge of employees of UCT Prague or authorised persons (ie participants in leisure time activities – eg participants in chemistry clubs, excursions etc).

Article III

General requirements on operation of laboratories and work therein

1) Laboratories and/or their material technical equipment shall be used exclusively for the purposes for which they have been intended and solely in a safe manner, ie in compliance with valid legal and other regulations, internal regulations of UCT Prague, safety data sheets of the used chemicals, manuals of technical equipment etc.
2) Laboratories and/or their material technical equipment shall be used exclusively in accordance with legitimate interests of UCT Prague. The use of the laboratories and/or their material technical equipment for private purposes of employees or students is forbidden.
3) Each chemical and school laboratory must be equipped with a sufficient amount of appropriate sanitation means in case of a leak of the used chemical substances. All persons working in the laboratory must have easy and fast access to first aid means (first aid kits) and decontamination means (body showers, eye showers or decontamination sets). The location of the above means must respect the local conditions.
4) The entrance door to the laboratory, warehouse or other area where hazardous chemical substances or mixtures or sources of ionising or non-ionising radiation are handled must be marked with the relevant safety markings in accordance with CSN ISO 3864-1.
5) For each laboratory a person must be appointed that will be responsible for the operation of the laboratory (hereinafter as the 'head of laboratory') and who will be responsible for meeting the safety rules and instructions of the employer in the given laboratory and compliance thereof. The responsible person is appointed or dismissed in writing by the head of the relevant organisational unit of UCT Prague (faculty, institute or department). The appointment template form is in Annex 2. The dismissal template form is in Annex 5[1]. The documents related to the appointment or the termination of appointment are archived by the secretary of the given unit where they must be available in case they are needed.
6) The head of laboratory can be authorised to perform the role of the authorised person for the entire laboratory unit (an area that includes more laboratories and their background) or for several independent laboratories at the same time. The head of

[1] The given template form can be used analogically also to terminate the authorisation of an employee to perform a role such as: OHS Officer, FP Preventionist, HSM Officer (= Officer for handling with hazardous substances and materials), Gas Equipment Officer, Medical Officer etc.

laboratory reports directly to the responsible head of the relevant organisational unit of UCT Prague who has entrusted them with this role.

7) In a school laboratory, the supervising person[2] monitors compliance of the present students with safety rules and instructions.

8) If highly toxic chemical substances or chemical mixtures (labelled as Acute Tox. 1 a Acute Tox. 2 in CLP) are used in the laboratory, they must be used in accordance with PPHA, in particular, they must be stored in a locked cupboard or safe or in a separate room secured against entry of unauthorised persons; in addition, records must be kept of their warehouse stock in a predefined manner (see Article X).

9) Individual activities in handling highly toxic chemical substances or chemical mixtures may be performed only by persons with the relevant qualifications or persons that have been trained by them who are of age (eg students).

10) If radiation activities are carried out in the laboratory, the requirements set out in AA and its implementing regulations, the permission granted by the State Office for Nuclear Safety ('SUJB') and the programme to ensure radiation protection must be observed. The person with the direct oversight of radiation protection is responsible for compliance with the above requirements (for more, see Article V).

11) Only employees and students in Doctoral study programmes or employees performing assigned work activities with the knowledge of the head of laboratory (eg maintenance, cleaning, revisions, inspections) can freely and independently move around the laboratories. Students in Bachelor and Master study programmes can be present in laboratories only when fulfilling their study obligations and with the knowledge and consent of the supervising person. Other persons (eg employees of other departments, visitors, participants in chemistry clubs or excursions etc) can enter the laboratories only with the consent of the head of laboratory or a person authorised by the head of laboratory and in their presence. Free, unsupervised entry of such persons and their staying there is forbidden.

12) Employees of the laboratory must secure the laboratory against unauthorised entry of unauthorised persons by closing/locking the entrance door.

13) If stipulated in another legal regulation or internal regulation of UCT Prague regarding safety, the relevant warning and prohibition safety signs must be placed on a visible place (eg 'NO ENTRY – AUTHORISED STAFF ONLY**').**

14) Only persons with appropriate health and professional status can work in the laboratory. All persons present in the laboratory must comply with the provisions of the fire safety rules provided they have been issued for the given laboratory.

15) When doing laboratory work, employees and other persons must wear appropriate clothes and equipment to minimise the risk of injury or another extraordinary operating event. This includes in particular:

[2] The supervising person can be an instructor (ie the head of the practical or a substitute teacher) or a professionally qualified employee of UCT Prague or a PhD student studying at UCT Prague authorised by them.

a) Wearing properly fastened close-fitting clothes without loose parts (for more, see Art. IV, point 2, letter e). The lab coat must be fastened all the way down. It is not recommended to wear clothes made from artificial fibres that catch fire easily.

b) Long hair or beard must be worn so that contact with chemicals, open fire or rotating parts of technical equipment is prevented (eg worn in a ponytail, plaits or bun or covered by a net).

c) No jewellery is allowed on hands (rings, bracelets). Necklaces must be worn under the clothing so that they do not dangle when leaning forward.

d) Shoes with non-slip soles resistant to the effects of chemical substances must be worn. The shoes should be closed on the toe and instep to prevent any liquids from entering. It is advisable that the shoes be made so that they can be quickly removed if necessary (eg galoshes, slip on shoes with a fastening strap on the heel, Velcro fastening sneakers etc).

e) Using prescribed personal protective equipment (eg work clothes and shoes, eye, face, respiratory and hand protective equipment) depending on the potential risks related to the performed activity and in accordance with the instructions given in safety data sheets of the used chemical substances and mixtures. The details are stipulated in a separate internal regulation of UCT Prague.

16) It is not recommended to use contact lenses when doing laboratory work, in particular during activities when the vapours of the used chemical substances might corrode them. The supervising person or the head of laboratory are authorised to decide about a ban on contact lenses during specific laboratory work.

17) Before they start working in the laboratory, all persons that will perform laboratory work must be acquainted with the potential risks and measures adopted to prevent injuries and other extraordinary operating events (eg fire protection rules of the laboratory). All persons working in the laboratory must prepare properly for the planned work.

18) The laboratory and the individual workplaces must be kept in order and clean, walkable corridors, aisles and emergency exits must be kept clear, floors must be kept clean (any spills or other contamination must be removed immediately) and no objects may be stored in places where they might block access (including leg room, underneath desks for sitting).

19) Laboratory work must be carried out with concentration, caution and carefully; it must be done so that leakage of hazardous chemical substances/mixtures or other hazardous materials, the occurrence of fire, threat to lives and health of persons or property damage is prevented.

20) In the course of laboratory work where there is a heightened risk of occurrence of an extraordinary operating event (eg during exothermic chemical reactions, preparation of explosives or self-igniting substances, when working with explosives precursors, using open fire or other ignition sources, gas and electrical appliances, apparatuses and equipment etc), it is prohibited to leave the work place or do activities that might distract the person.

21) Work with chemical substances that release hazardous gases, vapours or aerosols must be done in the fume hood with switched on suction. If, for objective reasons, this is not possible, the persons performing this work must use respiratory protective equipment. To protect from hazardous vapours and gases, full face masks or half face masks with appropriate filters are usually used. To protect from fumes and non-corrosive aerosols, filtration masks made from special non-woven fabric are usually enough. The choice of the appropriate personal protective equipment is made based on risk assessment with regard to potential exposure to hazardous chemical substances or mixtures and information stated on the safety data sheets.

22) Persons working with chemical substances that etch, irritate or degrease the skin must use protective gloves. The information about what kind of gloves should be used is given in the safety data sheet of the given chemical. When working with most substances, including weak corrosives, it usually suffices to wear nitrile or vinyl gloves. When working with strong corrosives, butyl gloves must usually be used. Synthetic latex gloves are least resistant to corrosives or to piercing or cutting. These gloves can be used only for work where the only risk is soiling or staining the gloves with colouring substances.

23) Persons performing work that involves the risk of splashing or spewing of the reaction mixture, flame propagation, outburst of fumes or vapours or dispersion of solid particles (such as shards of broken glass) must use eye and face protective equipment (ie protective goggles and a shield). Protective goggles must be used during all laboratory work. When performing riskier work, the shield must be used; it must be worn and fastened properly so that the gap between the chin and the shield is minimal.

24) Technical equipment (ie measurement equipment, fume hoods, gas and electric appliances, movable leads and cords, mechanical equipment and tools etc) used in the laboratory must be used only when they have no defects. The head of laboratory must ensure regular maintenance, repairs, cleaning, inspections, functional testing and revisions in compliance with the instructions of the manufacturer given in the accompanying documents (eg instructions for use).

25) The used technical equipment must have operating documents available that the head of laboratory must store, supplement and update. The instructions for use or written operating instructions for use of the given equipment must be in the Czech language and must be freely accessible to the operators. People who do not speak Czech must be given these instructions in an appropriate and adequate manner to ensure that they sufficiently understand them.

26) Sufficient working and manipulation space must be ensured for individual machines and pieces of technical equipment that allows safe operation or inspection of their functionality. The minimum width of the manipulation space is 0.6m.

27) Fume hoods must be regularly tested, inspected and maintained in accordance with the requirements set out in standards of the CSN EN 14175 line and the manual of the manufacturer (if available). Functional testing includes checking the suction performance at least once in three months. The testing can be done visually using a fume generator and observing whether the hood sucks the fume, or by using a regular standard method based on using measurement equipment (anemometers). The operability inspection and regular maintenance of the fume hood must be done by a specialized company at least

once a year. This includes mainly regular maintenance and cleaning of the inside of the box, inspection of the movable parts of the hood (the door, pulley and steel cables) and glass panels, changing of filters, cleaning of the suction holes and ventilation routes etc.

28) When working with technical equipment, it is only allowed to touch the parts that are intended for operating the equipment. While working with the equipment, the instructions of the manufacturer (see the instructions for use), or written operating instructions for work must be observed and attention paid to personal safety.

29) Chemical substances and mixtures stored in the laboratory must be stored in places intended for storage and in undamaged packaging designated by the manufacturer for their safe storage. A non-removable label must be attached to the packaging that will include a legibly written name of the stored chemical and a sign according to the classification of hazardous substances pursuant to CLP. The head of laboratory must perform regular inspections of the integrity of the packaging of the stored chemical substances, monitor potential deformations, wetness on the surface and leaking gases/vapours. Damaged, deformed or untight packaging must be replaced immediately and labelled properly.

30) When stored, hazardous liquids must be placed in boxes or trays with high rim that are able to withstand exposure to these chemicals in case of a potential leak. Corrosive liquids must not be stored higher than the shoulder height of the worker manipulating with them (no higher than 165cm) so that the worker is not in danger of spilling the liquid on them when manipulating with it. Flammable liquids must not be stored in places higher than 2m from the floor.

31) When storing chemical substances in the laboratory, a potential contact with other substances must be prevented that may cause an undesirable chemical reaction. In particular, a potential contact with strongly oxidising substances or mixtures with organic substances must be prevented.

32) Before leaving the laboratory, the last employee present or another employee authorised by the head of laboratory (or in case of a school laboratory, the supervising person) must check that all gas equipment and electrical appliances are switched off and windows closed. They have to switch off the equipment that is still on, with the exception of equipment that is intended and constructed for continuous operation, or is operated in accordance with the manual of the manufacturer. After leaving, the laboratory must be secured against entry of unauthorised persons (eg by locking the entrance door, by codelocking etc).

33) If an unexpected situation occurs during which the safety of persons may be threatened or property damaged, the activity that has caused this situation must be interrupted (equipment switched off etc). This activity may be resumed only after the defectless function of the equipment is ensured by the authorised worker. The identified defects must be reported to the head of laboratory and a record must be made in the operational documentation, if such documentation is kept, or the OHS inspection log.

34) Any injury that happens during work in the laboratory eg by etching, consumption of a substance, cutting or any headaches, humming in the head and other symptoms must be immediately reported to the OHS officer of the given department (in case of employees) or the supervising person (in case of students). Any injuries, etching, poisoning etc that

happen not just in the laboratory must be recorded in the injury log of the given department.

Article IV

Prohibited activities

1) All persons are strictly prohibited to offer, donate, sell or otherwise supply, give or provide for other persons highly toxic chemical substances or chemical mixtures (labelled as Acute Tox. 1 or Acute Tox. 2 in CLP), radioactive substances, spontaneously reactive substances, explosive substances, explosives precursors, drugs precursors and other regulated hazardous substances and materials. This ban does not concern approved transfers of unused supplies of these substances among organisational units of UCT Prague (the so-called chemical market) unless this violates valid legal regulations.
2) In general, it is prohibited in the labs:
    a) To allow unauthorised staff to enter the laboratory.
    b) Entry of persons under the influence of alcohol or other mind-altering drugs or displaying signs of having used such substances.
    c) To smoke cigarettes, incl. electronic cigarettes and vaporisers or other types of cigarettes, eat, drink and use an open flame inappropriately.
    d) To do laboratory work without the use of required personal protective equipment.
    e) To do laboratory work in unfastened work wear or work wear with loose parts (eg scarves, kerchiefs, niqaabs, burqas, belts, long skirts, coats, pendants, log sleeves etc)[3], with unfastened long hair or beards, jewellery on hands (rings, bracelets).
    f) To use laboratory ware for eating, drinking or storage of food.
    g) To taste any chemical substances or products of chemical reactions; to insert in mouth or eyes hands contaminated by chemicals.
    h) To store food or drinks intended for consumption in fridges or freezer boxes intended for storage of chemical substances, chemical mixtures, biological materials and samples.
    i) To put in laboratory washers chemical ware that has been contaminated with strong acids or alkalis, toxic substances, irritants and substances that decompose vigorously on contact with water.
    j) To use as substitute containers for storage of chemical substances and samples containers used for food, drinks, drugs or cosmetics.
    k) To perform laboratory work without being properly prepared for it, do it hastily or do it knowingly in a risky manner.

[3] In justified cases and unless the safety and protection of health of the present persons is put at risk, the head of laboratory may allow wearing certain specific parts of clothing or accessories (eg nylons, wigs, close-fitting kerchiefs, elbow supports, burkini etc).

l) To handle chemical substances contrary to instructions provided in their safety data sheets.

m) To store objects (including chemicals and equipment) in a manner that does not ensure their stability, or so that they may slip or fall easily.

n) To use damaged technical equipment, laboratory ware, aids and apparatuses.

o) To use technical equipment contrary to the manufacturer's manual, local operational safety regulations, conclusions of the performed inspections/revisions or without a valid operational inspection/revision.

p) To block with objects or materials walkable aisles, escape routes and exits, access to fire extinguishing equipment, means for providing first aid, switchboards, switches.

q) To deactivate protection or safety systems, damage safety markings or decrease the efficiency of the installed markings (eg visual signalisation).

r) To work with low boiling point flammable liquids without appropriate ventilation of the workplace or so that, with regard to local conditions, their vapours might explode. It is prohibited to manipulate with open fire or other sources of ignition within a distance of less than 5 metres from low boiling point flammable liquids.

s) To leave a burning burner, a heating mantle or another source of potential fire unsupervised.

t) When working in an area where a risk of explosion exists, to work with tools that might create a static charge or with other sources that form sparks.

u) When working, to use inappropriate, damaged or heavily soiled personal protective equipment or tools.

v) To leave alkali metals exposed to air.

w) To pipette using mouth.

x) To put in general refuse bins any chemicals (including unreacted sample residues, reaction products, used chemicals packaging), glass shards, syringes etc.

y) To elevate one's working place or output with unstable objects or objects intended for other use (boxes, barrels, chairs etc).

3) Pregnant women are banned from work that includes exposure to chemical substances or chemical mixtures that:

a) cause acute or chronic poisoning with severe or irreparable effects on health H300, H301, H310, H311, H330 or H331 or a combination thereof, or with hazard statements H370, H371 or H372,

b) classified as carcinogens of category 1A, 1B or 2 with hazard statements H350, H350i or H351,

c) classified as mutagens in germ cells of category 1A, 1B or 2 with hazard statements H340 or H341,

d) are toxic for reproduction with effect on the foetus inside the mother's body of category 1A, 1B or 2 with hazard statements H360, H360D, H360FD, H360Fd, H360Df, H361, H361d or H361fd,

e) sensibilising the respiratory tract or skin with hazard statements H334 or H317.

4) Pregnant are banned from work:

a) on production and processing of explosives or explosives objects and from manipulating with them,

b) on production of drugs or veterinary preparations that contain hormones, antibiotics or other biologically highly efficient substances unless it can be ruled out, based on a health risk assessment, that the health of the woman or the foetus might be damaged,

c) on production of cytostatics or antimitotic drugs, their preparation for injection application, the performance thereof or when treating patients treated with cytostatics or antimitotic drugs,

d) during which the effective dose of 1 mSv/year of ionising radiation affecting the foetus might be exceeded,

e) linked to exposure to hardwood dust with carcinogenic effects,

f) linked to exposure to the rubella virus, other biological agents of group 2, 3 and 4 listed as risky or as cause of toxoplasmosis, unless it can be proved for the pregnant woman that she is immune to the biological agent that she might be exposed to during this work.

5) More detailed requirements on work and work places that pregnant employees, breastfeeding employees and employees-mothers up to 9 months after giving birth and young employees are banned to work at are stipulated in a separate internal regulation.

Article V

Special requirements on operation of laboratories where radiation work is performed

1) Radiation work refers to any handling with radioactive material or other sources of ionising radiation in the course of a deliberate exposure situation, while:

a) radioactive material can be an original material, special fissile material and another fissile material that can be of importance in ensuring non-proliferation of nuclear weapons (ie uranium, thorium, plutonium and compounds thereof),

b) a source of ionising radiation may be a radioactive substance or equipment that contains or releases radiation, or a radiation generator through which equipment can generate ionising radiation.

2) Radiation work may be performed only based on notification/permission of SÚJB and only in specific laboratories.

3) Spaces where radiation work is performed or where nuclear materials or sources of ionising radiation are stored must be secured against entry of unauthorised persons

(using a special key, chip card or code lock), marked with appropriate safety markings, and the used nuclear materials or sources of ionising radiation must be secured against unauthorised manipulation or theft.

4) Laboratories where work with open radionuclide sources is carried out must comply with the conditions specified in Decree No. 422/2016 Coll. In particular, the walls and ceiling must have a washable and non-porous surface, the floor must be covered with a durable, easy-to-clean flooring (for example, PVC), the work surfaces must be made from an easily cleanable material, such as laminate or stainless steel, compact and seamless, the waste sump must be made of an easily cleanable material.

5) The workplaces of UCT Prague where radiation work is carried out are classified in category I in accordance with Section 61, Para 3 of AA. They are workplaces where small sources of ionising radiation, or radionuclides with low activities and low radiotoxicity, are handled.

6) During all radiation work, radiation protection must be ensured, ie appropriate measures must be adopted to lower the adverse effects of ionising radiation on persons to an acceptable level by society, and the occurrence of extraordinary radiation events must be effectively prevented.

7) Radiation accident refers to an unplanned event when persons are put in danger due to effects of ionising radiation. In workplaces with sealed radiation emitters, this may concern, in particular, undesired radiation exposure of persons. In workplaces with unsealed radiation emitters this may concern an uncontrolled leak of a radioactive substance into the working environments (eg by spilling, splattering, breaking a container with a radioactive solution etc) with subsequent contamination of the working environment or persons. Such events may happen during manipulation with open unsealed emitters in the process of their preparation, transport, storage, application and disposal.

8) The supervising person appointed by the rector in writing pursuant to Section 72, Para 1 of AA is responsible for compliance with requirements on ensuring radiation safety. Persons directly supervising radiation protection are responsible for ensuring radiation protection at individual workplaces where radiation work is performed. All persons that perform radiation work at UCT Prague workplaces must strictly adhere to instructions given by these individuals.

9) More detailed requirements on handling with sources of ionising sources and ensuring radiation protection are stipulated in a separate internal regulation.

Article VI

Special requirements on operation of school laboratories

1) Abridged rules of operation must be issued for each school (student) laboratory. A template form is provided in Annex 1. The abridged rules of operation can be supplemented by the head of laboratory with other important facts and information necessary for ensuring safety and health protection during work at the given laboratory.

2) Students can be present in a school laboratory only when the supervising person is present or when they are informed about it.

3) Students must take only things that are necessary for their work to the laboratory or workstation, such as work instructions (itinerary of the laboratory exercise), writing instruments and laboratory notebook. Other things must be stored in designated places, ideally outside the school laboratory (eg in a cupboard or cloakroom).

4) Students must wear a long lab coat made of cotton, closed-toe work shoes suitable for work in a laboratory with non-slip sole, safety goggles, gloves and other personal protective equipment depending on the potential risk (see safety data sheets of the used chemical substances, instructions of the supervising person). During laboratory work it is prohibited to use shoes such as canvas slippers, flip-flops, sandals etc that do not provide protection against slipping.

5) The supervising person must demonstrably and clearly acquaint students with this Directive or with the laboratory rules in the first laboratory practice lesson at the latest. Students will confirm the completed training with their signature (the template form of training record is provided in Annex 3).

6) Before laboratory work begins, the supervising person must acquaint students with the task assignment, working procedure, requirements on the use of personal protective equipment and in a suitable way (eg by a written test, questioning, brainstorming) check that the students have understood the instructions. Special attention must be given to foreign students that do not speak Czech and to persons with disabilities.

7) Before work begins, students must check that they have all appliances and equipment necessary for the successful completion of the assigned task.

8) Before work begins, students are banned to manipulate with chemicals and the technical equipment in the laboratory.

9) Students shall use only the designated area and appliances that have been assigned to them. They are personally responsible for the appliances and equipment.

10) Students can start work only with the consent of the supervising person.

11) Students can perform only laboratory work listed in the instructions for the given task and they have to comply with the provided working procedure. Other works can be performed only with the consent of the supervising person. Students must not arbitrarily change the prescribed work procedures and perform activities in the laboratory that are not related to completing the assigned task.

12) Students must keep strict order and cleanliness in the area that has been assigned to them for work.

13) During the performance of laboratory work, everyone must stay calm, be fully concentrated and work with consideration. It is prohibited to use mobile phones or other devices that might distract the people in the laboratory (eg listening to music, using headphones, watching films etc).

14) When using technical appliances, in particular gas and electrical appliances, students must exercise extreme caution and only perform tasks included in the given instructions or follow the instructions of the supervising person.

15) Students may work with gas appliances, including work with gas pressure vessels, only after they have received the necessary training and in the presence of the supervising person who has the required qualifications to use pressure vessels in accordance with the relevant internal regulation of UCT Prague. Students are prohibited to manipulate with pressure vessels, move them, switch pipes, hoses, reducing valves etc.

16) During the whole course of work in the school laboratory, students must not, without the consent of the supervising person, leave their workstation, or leave the running experiment or laboratory equipment unsupervised.

17) After the work has ended, the student must close all containers with chemicals, liquidate ecologically all unreacted residues and generated waste, close used gas and water taps, switch off the used electrical appliances or switch them to standby mode in compliance with the instructions and clean their workstation in accordance with the instructions of the supervising person.

18) Before leaving the school laboratory, the student must hand over the workstation to the supervising person.

19) Students must report to the supervising person all defects that have occurred in their workstation, as well as any injury or sickness that might have occurred due to the performed laboratory work.

Article VII

Instructions for performance of laboratory work

1) When manipulating with chemical substances in test tubes and opened containers, the neck must be tilted away from the person holding it and from other persons.

2) When manipulating with storage bottles with liquids, the bottle must be held by the label.

3) Odours of substances must not be determined by smelling the neck of the container; the vapours must be wafted.

4) Solutions must be mixed with a glass rod, not a thermometer or a spoon.

5) Laboratory work must be organised so that persons are not exposed to volatile chemical substances or fumes occurring during chemical reactions.

6) Any manipulation with hazardous gases, vapours and fuming, irritating or odorous substances must be done only in the fume hood. During this work, the fume hood must be switched on.

7) The feed hoses to the gas burners must be intact and made of one piece with a maximum length of 1.5m.

8) When using gas burners, the manufacturer's instructions must be followed. The general procedure for lighting a gas burner is as follows:

   - Turn off the air supply to the burner.
   - Turn off the gas supply to the burner.
   - Turn on the gas supply to the workstation.

- Turn on the gas supply to the burner.
- Wait a few seconds until the gas pushes the air out of the burner hose.
- Place a burning lighter with an extended nozzle or a match sideways to the mouth of the burner.
- Using the air intake control, adjust the size and intensity of the flame.

9) The burner is switched off in the following way:
   - Turn off the air supply to the burner.
   - Turn off the gas supply to the burner.
   - Turn off the gas supply to the workstation.
10) Burning burners must not be left unsupervised. If the flame flashes inside the burner or is blown out, the gas supply to the burner must be turned off immediately and the burner must be adjusted.
11) When working with laboratory glassware, breaking the glassware and cut injuries to persons must be prevented. Shards and other waste with sharp edges must be put away to designated containers properly labelled with the label or symbol of 'Danger – sharps waste'.
12) Laboratory glassware handed over for repairs must be clean, dry and all chemicals residues must be removed.
13) When assembling glass apparatuses, only compatible parts must be used; ground joints and stoppers must be lubricated with suitable fat before assembly.
14) When glass rods, thermometers etc are placed in rubber stoppers or hoses, hands must be protected by eg textile gloves or a thick cloth.
15) When working with vacuum or overpressure in glass apparatuses, suitable containers must be used designated for this work by the manufacturer. The glass apparatus must be placed in a sealable fume hood or protected by a cover and secured against shifting or falling to the ground. The apparatus must be properly inspected before use. In the event of even minor cracks, the apparatus is prohibited from use.
16) Oil baths may be heated only to a temperature below the flash temperature of the used oil. If water appears in the heated baths, heating must be interrupted and the oil replaced.
17) Strong oxidising agents must not be heated using an open flame or oil bath.
18) When heating substances, superheating must be avoided by appropriate techniques (boiling chips, Teflon stirring rods or capillary tubes for vacuum distillation).
19) When heating flammable liquids, the specific properties of the heated system must always be assessed and precautions must be taken to prevent fire or vapour explosion. Special attention must be given to work with ether and carbon disulfide.
20) When nitrating, it is necessary to work carefully and strictly adhere to the established working procedure. It is necessary to avoid accidental mixing of nitric acid with sulphuric acid (nitrating mixture) – explosion hazard.

21) Concentrated acids shall be diluted by pouring acid to water. The acid is poured in a thin stream, in portions and the solution must be constantly mixed with a stirring rod. The reverse procedure, ie pouring water to acid, is prohibited.

22) When dissolving solid sodium hydroxide or potassium hydroxide, the hydroxide is added to water in small portions while stirring constantly; you must always wait until the previous portion has dissolved.

23) Solid chemicals must never be held by naked hand, poured into the palm etc; when manipulating with them, a clean laboratory spoon, spatula or weighing bottle must always be used.

24) Liquids must be pipetted using suction balloons, extensions or automatic pipettes. Pipetting by mouth is strictly prohibited.

25) Contact between strongly oxidising substances and mixtures with organic substances must be avoided.

26) When distilling flammable liquids, the apparatus must not be left unsupervised. When using water cooling, the water supply to the cooler must be checked regularly.

27) In separation processes such as filtration, extraction, sublimation, adsorption, evaporation and centrifugation, if working with flammable liquids, the formation of explosive mixtures must be prevented and sources of fire initiation must be excluded.

28) Mixing, grinding and stirring, if working with flammable liquids or substances with a low flash point, require similar precautions to separation processes. Local overheating, which may occur during grinding or mixing of solids, must not occur. Precautions must be taken to prevent explosions or fires caused by dust or vapours of flammable liquids.

29) In case of spillage of flammable liquids, the gas appliances in the room (including gas heaters) must be immediately switched off, and possibly also the electricity outside the room must be turned off, unauthorised persons must not enter the room and good ventilation must be ensured (not to the corridor). The spilled liquid must be sprinkled with an inert sorbent (eg vapex or granulated bentonite) and removed to a designated place (to metal containers placed in a well-ventilated area).

30) Spilled non-polar solvents must not be mopped on the floor or a plastic pad (static electricity hazard!).

31) Flammable liquids must be stored in original, airtight and undamaged containers intended for flammable liquids, the opening always facing upwards – including empty containers.

32) Alkali metals must be stored in metal boxes properly labelled with a warning symbol or the text ‘Do not extinguish with water’. Stored alkali metals must be kept under a sufficient layer of kerosene or paraffin oil (the level must reach at least 2cm above the alkali metals) and the loss of liquid must be regularly checked and replenished.

Article VIII

Instructions for performing radiation work in laboratories

1) Radiation work must be performed only by designated (authorised) persons who have received proper training and are equipped with personal protective means and equipment.
2) When handling with nuclear material or other sources of ionising radiation, their safe transportation, storage and use must be ensured.
3) Radionuclide emitters can only be accepted in solid containers that ensure protection of the environment against radiation and contamination labelled with a warning symbol and accompanied by a certificate of the radioactive substance and its activity.
4) Radionuclide emitters and other sources of ionising radiation may be acquired only from suppliers with a valid certificate issued by SÚJB. Acquisition from other suppliers is strictly prohibited.
5) Any manipulation with open radionuclide sources may be done only in a monitored or controlled area under corresponding safety measures.
6) All high activity preparations and samples must be placed (stored) in a suitable place, in particular safeguarded by adequate shading, against breaking, spillage or manipulation by unauthorised persons.
7) When transported within the workplace, all preparations and samples that contain radionuclides must be properly marked, shaded in a proper manner (eg stored in a metal container) and secured against uncontrolled radiation leakage (a closed container on a support tray).
8) When manipulating with open radionuclide sources, maximum caution must be exercised to prevent leakage and subsequent contamination (pollution) of objects, working environment and persons.
9) Any leakage of a radioactive substance or contamination of workspaces, appliances, clothing or persons must be immediately reported to the supervising person and the person with the direct oversight of radiation protection at the given workplace. Contaminated persons (body parts) must be decontaminated immediately by set procedures using decontamination kits.
10) In particular radiometers with amplified probes are used to continuously check surface contamination during work; they should be available at all workplace that perform radiation work.

Article IX

Instructions for liquidation of waste originating in laboratories

1) Solid waste that has no toxic properties and where spontaneous ignition is not a risk can be thrown in general refuse bins.
2) Only substances that are miscible with water and are not classified as toxic, highly toxic, explosive, releasing toxic, flammable or irritating gases when reacting with water, or

dangerous to the aquatic environment may be poured into the sinks (sewer system). These substances may only be poured into the sinks in a sufficiently diluted state (pouring into the water stream). Alkalis and acids must be diluted with water in a ratio of at least 1:30.

3) Shards, sharp-edged objects, needles etc must be placed in designated and properly marked collection containers. It is strictly forbidden to throw this waste in general refuse bins. After being filled and properly packed, the collection containers are handed over to the hazardous waste storage facility for ecological disposal.

4) Containers that include residues of hazardous substances or containers soiled by such substances must be placed in metal barrels located in the yards of Buildings A and B.

5) Residue alkali metals must be disposed of by being solved in ethanol. Empty containers in which alkali metals have been stored must be thoroughly cleaned of all residues of these substances to prevent ignition on accidental contact with moisture or water.

6) Spilled acids must be diluted with water, neutralised by sprinkling with a carbonate (soda, chalk etc) or by pouring a diluted hydroxide solution on them and then carefully rinsing them with water or collecting them in a cloth etc.

7) Wood sawdust or other organic materials must not be used to remove spilled nitric acid, perchloric acid and strong oxidizing mixtures; inert materials, such as diatomaceous earth or granulated bentonite, must be used to collect them.

8) Spilled mercury must be immediately sprinkled with zinc dust or sulphur and then carefully swept away. Mercury must be removed quickly and thoroughly to minimise its evaporation into the working atmosphere. Due to the carcinogenic effects of mercury, it is necessary to consistently protect the respiratory system and ventilate the room thoroughly when working with mercury.

9) Substances immiscible with water must be separated into organic non-halogenated and organic halogenated waste. These two types of waste will then be handed over to the hazardous waste storage facility for ecological disposal.

10) Highly toxic and toxic substances including empty containers that they have been stored in must be put in special bins and subsequently handed over to the hazardous waste storage facility for ecological disposal.

11) Waste containing radioactive substances or waste that can be contaminated with radionuclide emitters (such as work tools, laboratory ware, decontamination agents for contaminated liquids etc) must be stored in special containers (metal barrels) stored in the radioactive waste warehouse and subsequently handed over to a specialised firm for disposal.

Article X

Registration of hazardous chemical substances and mixtures

1) Records must be kept for hazardous chemical substances or chemical mixtures labelled as Acute Tox. 1 and Acute Tox. 2 according to CLP. Each organizational unit of UCT Prague will keep continuous records separately for all its workplaces in the form of a record logbook.

2) Record entries are kept in the record logbook separately for each above mentioned hazardous chemical substance and chemical mixture and they must include the following information:
   - name of highly toxic substance or mixture,
   - amount of received or released substance (gross and net amount),
   - current stored amount on a given date,
   - name of person to whom a highly toxic substance has been released,
   - possibly also the purpose of release.
3) Once in a calendar year, stocktaking of the stored items must be undertaken; it will be signed by the HSM officer (see Annex 4). The annual inventory list is handed over by the HSM officer to the head of registration of highly toxic substances (Department of Safety and Risk Prevention – 972) no later than on 31 March of the calendar year following the year for which the inventory was taken.
4) Individual departments must keep a register of stored hazardous chemical substances and mixtures[4]. In particular, this concerns chemical substances and mixtures classified pursuant to CLP as:
   - category 1A or 1B carcinogenic with standard hazard statements H350, H350i,
   - category 1A or 1B germ cell mutagenic with standard hazard statement H340,
   - category 1A and 1B toxic for reproduction with standard hazard statements H360, H360F, H360D, H360FD, H360Fd, H360Df and further with standard hazard statements H300, H310, H330, H370, H334, H317,
   - and groups of substances listed in paragraphs 3 and 4 of Article IV.
5) The above register must include the following information as a minimum:
   - identification of chemical substance (name and CAS),
   - stored amount,
   - location (unit, room).

Article XI

First aid guidelines

1) In life-threatening situations, it is essential to first perform resuscitation of the victim and call medical assistance.
   - In case of respiratory arrest, immediately perform artificial respiration.
   - In case of cardiac arrest, immediately perform indirect heart massage or use an AED.
   - In case of unconsciousness, place the victim in a stabilized side position.
2) For effective first aid, the following means and aids must be available on the spot:

[4] Ideally in a digital database of chemical substances and mixtures (such as SW CASEC).

- plenty of drinking water (if tap water is not available, then an emergency storage of ca 10 litres per person);
- blankets or other textile materials to protect the victim from cold and to adjust the victim's position, spare clothing including shoes;
- the prescribed contents of the first aid kit are stipulated in a separate internal regulation of UCT Prague.

3) When a toxic chemical substance is ingested – INDUCE VOMITING (especially in case of cyanides, certain inorganic metal salts, paraquat, diquat, methanol, ethylene glycol, certain organic solvents – benzene, tetrachloromethane, chloroform, carbon disulfide and other substances). Vomiting can only be induced in a conscious person within 1 hour of ingestion. Give the affected person about 1–2dl of preferably lukewarm water with a teaspoon of liquid soap and powdered or crushed activated charcoal in an amount corresponding to about 5 tablets. A larger amount of water is not recommended because if vomiting does not occur, water will facilitate the dissolution and absorption of the water-soluble substance, or it may even cause the toxic substance to move further into the digestive tract. Call the emergency medical service and contact the Toxicological Information Centre – provide them with information about the ingested substance.
4) When a corrosive substance is ingested – IMMEDIATELY RINSE THE MOUTH WITH WATER AND MAKE THE PERSON DRINK 2 to 5dl of cold water to reduce the thermal effect of the corrosive substance. Carbonated drinks are not recommended, as they can release carbon dioxide. Drinking a larger amount of liquid is not recommended, as it may cause vomiting and possible inhalation of the corrosive substance into the lungs. The victim must not be forced to drink, especially if they already have pain in the mouth or throat. In this case, only make the victim rinse their mouth with water. DO NOT GIVE THEM ACTIVATED CHARCOAL! (it will make it more difficult to examine the condition of the digestive tract mucosa by turning it black and it is contraindicated for acids and alkalis). Do not give the affected person any food or drinks. Call the emergency medical service and contact the Toxicological Information Centre – provide them with information about the ingested substance.
5) When organic substances are ingested (gasoline, diesel, kerosene, turpentine, mixed solvents containing gasoline etc) – DO NOT INDUCE VOMITING! If the victim vomits spontaneously, make sure they do not inhale the vomit (there is a risk of lung damage if these liquids are inhaled into the respiratory tract even in small quantities). Call the emergency medical service and contact the Toxicological Information Centre – provide them with information about the ingested substance.
6) When substances are inhaled (this applies to substances that cause pulmonary edema) – quickly move the victim to fresh air and do not let him walk! Depending on the situation, rinse the oral cavity or nose with water. If necessary, call the emergency medical service and contact the Toxicological Information Centre – provide them with information about the ingested substance.
7) If the skin is splashed with a corrosive – immediately remove the stained clothing and rings, watches and bracelets if they are in the areas where the skin has been affected. Keep rinsing the affected areas with a stream of lukewarm water for 10–30 minutes; do not use a brush, soap or neutralisation! Cover the burned areas of the skin with a sterile

bandage. Do not apply ointments or other medicines to the affected areas! After treatment, medical attention must be sought, especially in case of larger burns.

8) If the eye is affected – keep rinsing the eye with a stream of water for at least 10 minutes. Eyelids must be opened (forcibly, if necessary). If the victim wears contact lenses, they must be removed immediately. Do not perform neutralisation! After treatment, medical attention must always be sought.

9) In case of burns from fire or hot objects – the affected areas must be cooled by cold water or by applying plastic bags filled with water and ice (not just ice). Clothing soaked in the hot liquid must be removed immediately; parts of clothing that have stuck to the burns must not be removed. The burned areas are covered with a sterile bandage after they have been cooled; no ointments or powders shall be applied. In case of severe burns or if larger areas have been burned, medical attention must be sought.

10) In case of a mechanical injury – shards, shavings, dirt etc must be removed, the cut must be rinsed with a stream of water and then treated with hydrogen peroxide or another disinfectant. Larger cuts must be covered with a sterile bandage. OBJECTS STUCK IN THE EYE MUST NOT BE REMOVED, but emergency medical service must be called immediately.

11) In case of electric shock – first cut off the power supply or free the victim so that the rescuer is sufficiently insulated from the ground with a dry wooden, rubber or glass mat. Perform resuscitation and immediately call the emergency medical service.

12) Important telephone contacts:

- Emergency medical service: toll-free hotline 155.
- Toxicological Information Centre: tel. 224 919 293 or 224 915 402.

Article XII

Final provisions

1) The Directive includes the following Annexes:

- Annex 1: Rules of operation of school laboratory – template form,
- Annex 2: Template form of appointment of employee as ‘head of laboratory’,
- Annex 3: Record of performed training of persons working in laboratory,
- Annex 4: Annual inventory list of highly toxic substances – template form,
- Annex 5: Termination of authorisation of employee – template form.

2) This Directive is without prejudice to the obligation to prepare specific rules of operation for laboratories where hazardous substances or materials are handled based on a permission, authorisation or licence granted by the relevant state administration bodies pursuant to special legal regulations.

3) This Directive comes into effect on the day it is signed and it comes into force on the day it is issued.

4) This Directive cancels Directive No. A/S/962/2/2019 and Directive No. A/S/962/3/2019 of 15 February 2019 and Decree No. A/V/961/10/2020 of 19 March 2020 and Decree No. 30.15/07 of 14 September 2007.

5) These Rules of Operation for Laboratories must be available in paper form in all laboratories and at the same time they must be available to all employees of UCT Prague on the Intranet.

6) The abridged rules of operation of a school laboratory must be hung in every school (student) laboratory on a visible and permanently accessible place. The head of laboratory, or the head of the relevant organisational unit, is responsible for hanging the rules.

7) More detailed requirements on ensuring fire protection are stipulated in Directive No. A/S/961/3/2024 (Fire Protection Rules for Buildings A, B, C, of the University Campus Dejvická).

8) More detailed requirements on manipulation with pressure cylinders and tubing for technical gases are stipulated in Directive No. A/S/961/6/2022.

9) Heads of organisational units must acquaint all their subordinates with this Directive and consistently insist on adherence to it.

10) Violation of the obligations arising from this Directive, as well as from other internal regulations for ensuring safety, constitutes a violation of work discipline of employees within the meaning of internal standard No. A/N/961/5/2018 (Conditions of Employment of UCT Prague).

11) The Department of Safety and Risk Prevention is responsible for inspecting compliance with the obligations set out in this Directive and for its updates.

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Rector