Work Environment Guide

For the Department of Chemical Engineering, Biotechnology and Environmental Technology

Faculty of Engineering, University of Southern Denmark

Information for employees and students. Read this leaflet carefully

Further information is available on http://www.sdu.dk/KBM

Safety Precautions at the Department of Chemical Engineering, Biotechnology and Environmental Technology (KBM)

Alarm in case of fire or other accidents:

Follow the guidelines in the emergency plan

Accidents: In case of accidents call 1-1-2 and direct the ambulance to **Campusvej 55 Bygning 43/44**

Follow the instructions in the emergency plan

Inform SDU at +45 6550 8888.

In case of acute water damage, power failure and similar: **8888 (+456550 8888)** (SDU extension number) 24-hours.

Poison Information: Poison Control Hotline: +45 8212 1212

Chemical Emergency Response Team: Danish Emergency Management Agency (DEMA), Chemical Lab (Beredskabsstyrelsen, Kemisk laboratorium):
+45 4582 5400, http://www.kemikalieberedskab.dk/

Emergency showers and eye cleaners are available in the laboratory
Fire extinguishers and fire blankets are placed next to the doors
Fire hoses are placed in the hallways

Emergency exits:
Keep informed about emergency exits at the department in order to find your way in case of fire

Employment injuries:
Employment injuries include hazardous exposure of a physical as well as psychological kind.

All employment injuries must be reported to the occupational health and safety management using specific forms. From there the forms will be forwarded to the National Office for Accidents at Work and Occupational Diseases (Arbejdsskadestyrelsen) and if necessary to the Danish Working Environment Authority (Arbejdstilsynet).

Personal protective equipment:

Available at the department:
- Glows
- Hearing protectors
- Security glasses

- Filter breathing apparatus

If there is a need for specific personal protective equipment this can be ordered.

All personal protective equipment can be found in room Ø32-508b-1.

Chemicals:

All chemicals at KBM are registered in a database, "Kemibrug". In the database you can find information on a number of chemicals which can be used for preparation of a work assessment (APV). Furthermore it gives you the possibility to print out labels for your produced solutions.

Please inform the laboratory technicians if you run out of labels.

All chemicals must be returned to the chemical collection. Toxic chemicals (labelled with the hazard symbols "Danger") must be kept in a locked cabinet or returned to the chemical collection immediately after use.

The amount of flammable materials, such as solvents, must not extend 50 fire units per room. Do not keep chlorinated solutions in the vicinity of flammable solvents.

An approved **workplace safety instruction for all substances and materials** has to be made before start working in the labs. Furthermore the safety form need to be fill out and approved forehand and given to the lab team.

General handling of chemicals:

Chemicals, materials and other equipment are purchasing by the laboratory technicians. Needed purchases can be given via an internal request form. The form should be signed by the supervisor and handed in to the lab team. Be aware that purchase can be rejected due to safety and financial causes.

All produced dissolutions have to be marked with the following:

- Content
- Concentration specification
- Production date
- Warning symbol
- Name
- Semester/group
- Responsible supervisor

All arrangements must be marked with identification notes, which can be found in all labs.

You are obliged to follow instructions given by the head of department or one of the working environment representatives.

Classes, either own classes or safety classes have to be worn in all labs working with chemicals.

Care should be taken that chlorinated combinations are not stored near inflammable solvents.

It's forbidden to smoke, eat and drink in the labs.

Lab work:

All tables and fume cupboards must be cleaned daily. Equipment and materials not in use must be removed.

- Used glass equipment must be rinsed and placed for washing up.
- Used glass equipment containing volatile chemicals must be kept in the fume cupboards.
- No bags or coats of any kind are allowed in the laboratories.
- Opening windows are emergency exits and must not be blocked by large furniture or experimental arrangements.
- By the end of a working day make sure that all doors to the fume cupboards are closed, that the lights are out and that all, windows and doors are closed and locked.

Under special circumstances the labs can be used outside normal working hours. For this you will need a signed permission from your supervisor. The form which has to be filled out and signed is available from the laboratory assistants.

It is only allowed to work alone in the labs after 4 pm and during the weekends, if one of your colleagues is within hearing distance.

To get access to the labs a code is needed. The code can be collected from the laboratory assistants after reading the Work Environment Guide.

If you are in doubt of anything, please do not hesitate to contact members of the work environment group.

WASTE:

Waste paper must be placed in the standard office bins or in black refuse sacks.

Waste glass: Empty glass packaging, bottles and similar must be cleaned to remove chemicals residue and placed in one of the waste glass containers, which can be found in the basement hallway. Hazardous chemical residues **must** be destroyed immediately and safely **by the user**, before the empty packaging is placed in the waste glass containers in the basement. Glass and bottles containing toxic chemical residues must be collected together with laboratory waste and placed on the blue pallet in the basement room B02. Waste bottles must be labelled with waste group and pH value. **REMEMBER** to state everything you know about the waste, i.e. all components must be written in 'waste components' space (affaldets bestanddele). Afterwards, the waste bottle must be placed on the blue pallet in basement room B02.

Needles, scalpels and other sharp objects must be placed in the yellow needle containers.

All chemical waste will be sent to 'Nord' in Nyborg for incineration.
The waste will be classified according to Nord's alphabet:

Guide as to classification

Classification into waste groups

The guide as to classification shows an overview of Kommunekemi's waste groups. It illustrates how to prioritise, sort and pack the waste properly. As a main rule you have to separate various waste types.

Does the waste contain heavily oxidising substances (f.ex. organic peroxides) or is the waste responsive to water (heavy reaction, development of inflammable or acidic gases)?	**O**
Does the waste contain mercury (f.ex. mercury batteries or COD liquids)?	**K**
Does the waste contain spray cans, pressure bottles, empty packagings, asbestos, medicine, isocyanates, batteries without mercury or mixed waste in minor packagings?	**Z**
Does the waste contain chemicals for pest control (f.ex. pesticides) or empty packagings from such chemicals?	**T**
Does the waste only contain inorganic substances (f.ex. hydrochloric acid, sulphuric acid, nitric acid, soda lye, cyanide baths, metal salts or fertiliser and fertiliser residuals)?	**X**
Does the waste only contain mineral oil products (f.ex. lubricating oil, fuel oil or diesel), but no emulsifying substances?	**A**
Does the waste contain substances with sulphur, fluoride, chlorine, bromine or iodine (f.ex. trichloride, freon, sulphur carbon, mercaptans or PCB)?	**B**
Is the waste liquid and is the calorific value of the waste minimum 18 MJ/kg (f.ex. petrol, turpentine, diluents, toluene, alcohol or acetone), and is the contents of water not higher than 50%?	**C**
Is the waste organic-chemical without halogen or suphur (f.ex. water-based glue, varnish or paint) or mixed organic and inorganic substances?	**H**

GHS

Globally Harmonised System of Classification and Labelling of Chemicals

This poster is only a simplified and exemplary view on GHS.
A direct conversion from GHS to the former EU classification and labelling is not possible.

The European Approach

PHYSICAL HAZARDS

Hazard classes and hazard categories*	Label elements | NEW**		Label elements | OLD	
Explosives • Unstable explosives • explosives, divisions 1.1 to 1.3 Self-reactive substances, mixtures, types A, B Organic peroxides, types A, B	 H200 H201, H202, H203 H240, H241 H240, H241	Danger	 (R2, R3)	Explosive
Explosives, division 1.4	 H204	Warning	No classification	
Flammable gases, category 1 Flammable aerosols, category 1 Flammable liquids, category 1	 H220 H222 H224	Danger	 (R12) (R12) R12	Extremly flammable
Flammable liquids, category 2 Flammable solids, category 1 Flammable solids, category 2	H225 H228 H228	Warning | Danger	 R11 (R11) (R11)	Highly flammable
Flammable aerosols, category 2 Flammable liquids, category 3	 H223 H226	Warning	No symbol (R10) R10 No classification flashpoint 56-60°C	Flammable
Pyrophoric liquids, category 1 Pyrophoric solids, category 1 Substances, mixtures which in contact with water emit flammable gases, categories 1, 2 and category 3	H250 H250 H260 H261 H261	Warning | Danger	 R17 R17 (R15) (R15) (R15)	Highly flammable
Self-reactive substances, mixtures, type B Self-reactive substances, mixtures, types C, D and types E, F Self-heating substances, mixtures, category 1 and category 2	 H241 H242 H242 H251 H252		 R12 R12	Highly flammable
Organic peroxides, type B Organic peroxides, types C, D Organic peroxides, types E, F	H241 H242 H242		 R7 R7	Oxidising
Oxidising gases, category 1 Oxidising liquids, categories 1, 2 and category 3 Oxidising solids, categories 1, 2 and category 3	 H270 H271, H272 H272 H271, H272 H272	Danger Warning	 R8 R8, R9 R8, R9	Oxidising
Gases under pressure – Compressed gases – Liquefied gases – Refrigerated liquefied gases – Dissolved gases	 H280 H280 H281 H280	Warning	No classification	
Corrosive to metals, category 1	 H290	Warning	No classification	

*Based on Annex I Regulation (EC) No 1272/2008 for all hazard categories with GHS pictograms

**Based on the translation table of Annex VII Regulation (EC) No 1272/2008

***Specific Target Organ Toxicity

HEALTH HAZARDS

Hazard classes and hazard categories*	Label elements | NEW**		Label elements | OLD	
Acute toxicity, categories 1, 2 • Oral • Dermal • Inhalation	H300 H310 H330	Danger	 R28 R27 R26	Very toxic
Acute toxicity, category 3 • Oral • Dermal • Inhalation	 H301 H311 H331		 R25 R24 R23	Toxic
Germ cell mutagenicity, categories 1A, 1B Carcinogenicity, categories 1A, 1B Reproductive toxicity, categories 1A, 1B STOT***, single exposure, category 1 STOT***, repeated exposure, category 1	H340 H350 H360 H370 H372	Danger	 R46 R45, R49 R60, R61 R39 R48	Toxic
Respiratory sensitisation, category 1 Aspiration hazard, category 1	 H334 H304		 R42 R65	Harmful
Germ cell mutagenicity, category 2 Carcinogenicity, category 2 Reproductive toxicity, category 2 STOT***, single exposure, category 2 STOT***, repeated exposure, category 2	H341 H351 H361 H371 H373	Warning	 R68 R40 R62, R63 R68 R48	
Acute toxicity, category 4 • Oral • Dermal • Inhalation	 H302 H312 H332	Warning	 R22 R21 R20	
Skin corrosion, categories 1A, 1B, 1C	 H314	Danger	 R34, R35	Corrosive
Serious eye damage, category 1	H318		 R41	Irritant
Skin irritation, category 2 Eye irritation, category 2 Skin sensitisation, category 1 STOT*** after single exposure, category 3 • Respiratory tract irritation	H315 H319 H317 H335	Warning	 R38 R36 R43 R37	Irritant
• Narcotic effects	H336		No symbol R67	

ENVIRONMENTAL HAZARDS

Hazardous to the aquatic environment, acute, category 1 Hazardous to the aquatic environment, chronic, category 1	 H400 H410	Warning	 R50 R50/53	Dangerous for the environment
Hazardous to the aquatic environment, chronic, category 2	H411	—	 R51/53	

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