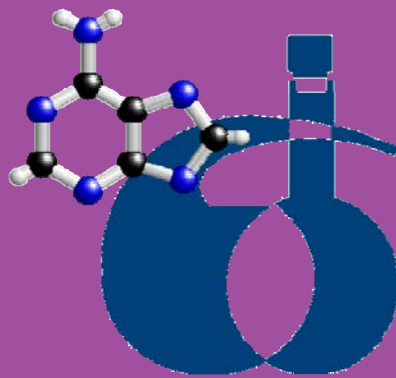




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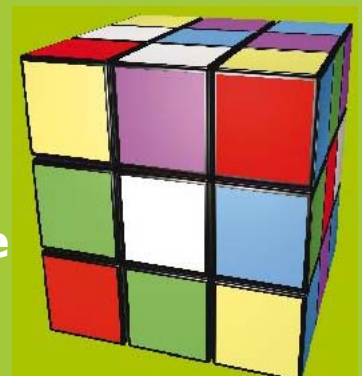


# Introductory Safety Guidelines



Department of Chemistry

Faculty of Science



## Declaration Of Openness

### **Safety and environmental awareness in dealing with chemicals**

KULeuven's Department of Chemistry arranges the education programs for chemists. These comprise acquiring and practicing the apprehension and insight in the structure and the properties of matter. This implies also imparting the necessary attitudes, knowledge and skills to handle chemicals in a safe and environmentally justified way in a lab environment.

Watching over the correct use of chemicals by people on the job site or in the close vicinity is unmistakably an integral part of the professional duties of a chemist. He/she is supposed to be an expert in the field of chemicals.

Potential risks in connection with chemicals must be acknowledged objectively. All necessary precautions have to be taken in order to prevent these substances from endangering the environment and the health of others in the unlikely event of their spreading outside of the laboratories.

The Department of Chemistry warrants that all personnel and all students – in collaboration with the Health, Safety and Environment service (HSE) of KULeuven - receive the necessary scientific and social education to allow them to act as reliable experts in a safe and environmentally friendly handling of chemicals in laboratories, both in the course of their training and later in their professional career.

The Department of Chemistry of KULeuven expects that all personnel and students follow the applicable rules (see [circular rector and general manager](#)) at all times and immediately report abuse, offences or slovenliness to the departmental HSE antenna, manager or chairman of the department.

Prof. Luc Van Meervelt

Chairman to the Department

# Preface

Dear reader,

Welcome to the Department of Chemistry at KULeuven.

This booklet will familiarize you with the health and safety procedures that are applicable to our Department. Thorough knowledge of these procedures will facilitate your smooth integration and is essential in maintaining the high level of safety practices and environmental awareness of the community of the Department of Chemistry.

Health, Safety and Environment (HSE) in and around the laboratory are topics that are the business of everybody here: *your* compliance with the HSE procedures will ensure that the Department of Chemistry is a healthy, safe and pleasant place to work for both you and your colleagues.

Please don't assume that your present safety knowledge, acquired elsewhere, will be sufficient, since – though this may be useful – each institution has its own specific set of safety practices that may differ from those with which you are already familiar.

In order not to jeopardize your own and your colleagues' health and safety, it is essential that you know and apply the proper procedures while working in the Department.

This booklet is only an introductory tool. Please read it very carefully.

**ALL LABORATORIES ALSO ADHERE TO SUPPLEMENTARY SAFETY INSTRUCTIONS. CONSULT YOUR PROMOTER FOR SPECIFIC INFORMATION.**

Extensive information is available from the Departmental Health & Safety website at <http://www.chem.kuleuven.be/safety/index.html>: visit it in case of doubt.

This document contains active links (**color** or **color coded**) and is available online at

[http://www.chem.kuleuven.be/department/department\\_en.html](http://www.chem.kuleuven.be/department/department_en.html).

We thank you for your effort, and wish you a pleasant, productive and safe stay at the Department of Chemistry.

Prof. Dr. Luc Van Meervelt  
Chairman to the Department

Prof. Dr. Chris Vinckier  
Member of the Departmental Commission on Health, Safety and Environment

Marcel Lasker  
HSE Network Coordinator

## Who Is Who

Chairman to the Department	Luc Van Meervelt	27609
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### Scientific Staff

Promoter	.....	.....
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Mentor	.....	.....
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### HSE Staff

HSE Department		22024
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HSE Network (HSE Representatives, EIP members, First Aid Members)

HSE Network Coordinator	Raf Goossens	27416
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HSE Network Member	Marcel Lasker	27443
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Specialized HSE Contact	.....	.....
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Person Responsible for the Safety Training	.....	.....
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### Contract/Administrative Matters

Operations Manager	Raf Goossens	27416
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**This booklet belongs to:** .....

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# 1 Chemicals In The Laboratory

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**Make sure you understand the risks of any experiment you carry out and apply the prescribed protective measures to avoid any physical harm to you and your co-workers. In doing so, you'll also protect the environment and the infrastructure. If you do not understand the risks of an experiment, then discuss them with your Mentor or your Promoter.**

The Royal Decree of 02/05/1995 on maternity protection states that the activities of pregnant and breastfeeding employees exposed to occupational hazards should be assessed and the necessary measures should be taken to protect mother and child. Some occupational hazards may endanger the pregnancy or the health of the unborn or newly born child . Hence the importance of early notification of pregnancy and intention to breastfeed.

Therefore immediately notify the **Occupational Medicine Service IDEWE** as soon as pregnancy is assessed.

For more information, consult **Maternity protection**.

## 1.1 Risk Assessment And Handling Chemicals

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**Standard office hours run Monday thru Thursday 8.00 am to 8.00 pm and Friday 8.00 am to 6.30 pm, except on holidays.**

**Manipulations involving chemicals are not allowed beyond these standard office hours, except when**

- 1. Explicit permission is granted by the Promoter;**
- 2. The lab's ventilation is active (see [Section 1.3](#));**
- 3. At least 2 people are present at all times.**

**A special procedure holds for unattended experiments (see [Section 1.9](#)).**

### Introduction

The preparation of a risk assessment for activities involving the use of chemicals is mandatory by law. This evaluation must precede the onset of any activity. It must be documented appropriately and amended whenever changes to the activity take place.

To warrant compliance with legal requirements an **Obligation To Make A Risk Assessment** (together with an Obligation To Declare Activities Involving Chemicals Subject To License) applies for all Unit Managers<sup>1</sup> whenever activities involving the use of chemicals are planned.

Said Obligations serve following purposes:

- Compliance with legal requirements;
- Assurance that the [HSE Department](#) can consult appropriately on activities involving chemicals of the most severe Hazard Class;
- Avoiding budgetary overruns as a consequence of unforeseen safety and environment related expenses.

### Field Of Application

This procedure applies to all activities involving the use of chemicals characterized by one or more R-phrases (including cytostatics according to the Royal Decree on carcinogenic agents) AND to said activities that are either

- New or
- Existing but void of risk assessment or
- Existing under risk assessment but with license expired or
- Existing but subject to modification or extension (e.g. chemicals, temperature range, pressure range, ...).

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<sup>1</sup> Person in charge per organization chart (niv4), i.e. position reporting to Department Chair, the Dean or the Director.

## Procedure for activities involving the use of chemicals of Hazard Class E4

Consult the BIG-database Hazardous Chemicals at <https://webwsp.aps.kuleuven.be/irj/portal/BIG> to find out which chemicals belong to this Hazard Class.

- Fill out the form [Risk Assessment: Activities Involving The Use Of Chemicals Of Hazard Classes E3 and E4](https://admin.kuleuven.be/vgm/intranet/EN/Documents/extensiveriskassessment.doc) (<https://admin.kuleuven.be/vgm/intranet/EN/Documents/extensiveriskassessment.doc>) for:
  - **New activities** - Submit the risk assessment to the [HSE Department](#) at least 5 weeks before onset of the activities. The risk assessment once submitted is valid proof of declaration.
  - **Existing activities** - The Unit Managers are responsible to monitor all activities involving the use of chemicals of Hazard Class E4. A risk assessment must be prepared and submitted to the [HSE Department](#) for all activities that are not covered yet by a risk assessment. The risk assessment once submitted is valid proof of declaration.
  - **Modifications to existing activities** - The Unit Managers are responsible to have the existing risk assessment reviewed thoroughly prior to onset of the modified activities. When the modifications alter the nature or the extent of the risks, a new risk assessment should be prepared. Submit the new risk assessment to the [HSE Department](#) at least 5 weeks before onset of the modified activities.
- Have the form checked by the Specialized HSE Contact and signed by the Unit Manager.
- Send the completed form to the HSE Network Coordinator, who will mail it to the [HSE Department](#).
- The [HSE Department](#) confirms receipt of the risk assessment within 10 working days. The confirmation of receipt will include possible requests for additional information, the identity of the HSE contact person that deals with the specific risk assessment and a timing estimate for approval of the assessment.
- Maximum 5 weeks after receipt of the complete package the [HSE Department](#) will inform the HSE Network Coordinator of the result of its investigation, including potential advise and restrictive conditions of use.
- Once the conditions specified in the [HSE Department](#) report fulfilled, the "new" or "modified existing" activity can be started.

For “existing activities” any additional requirements concerning curtailment and/or protective actions must be implemented as soon as possible by the Unit.

- The **HSE Department** will regularly perform internal audits to verify the implementation of the different Obligations specified in this procedure and of the curtailment measures.

### Procedure for activities involving the use of chemicals of Hazard Classes E3, E2 and E1

Consult the BIG-database Hazardous Chemicals at <https://webwsp.aps.kuleuven.be/irj/portal/BIG> to find out which chemicals belong to these Hazard Classes.

- Fill out the appropriate Risk assessment form for:
  - **New activities** involving the use of chemicals of **Hazard Class E3** require the preparation of a extensive risk assessment (<https://admin.kuleuven.be/vgm/intranet/EN/Documents/extensiveriskassessment.doc>) prior to the onset of the activities.
  - **New activities** involving the use of chemicals of **Hazard Class E2 and of Hazard Class E1** require the preparation of a brief risk assessment (<https://admin.kuleuven.be/vgm/intranet/EN/Documents/compactriskassessment.doc>) prior to the onset of the activities.
  - The Unit Manager must identify the **existing activities** for which no risk assessment has been prepared yet. For said activities the appropriate risk assessment shall be prepared prior to the onset of the activities.
  - The Unit Managers are responsible to have existing risk assessments reviewed thoroughly prior to onset of any **modified activities**. When the modifications alter the nature or the extent of the risks, a new risk assessment should be prepared.
- Have the form checked by the Specialized HSE Contact and signed by the Unit Manager.
- Send the completed form to the HSE Network Coordinator. The “new” or “modified existing” activity can be started.

Every Unit shall archive all its risk assessments. They may be required in case of accident or internal and external audits.

**Hazardous acids (HF, aqua regia, piranha etch) are forbidden. Only for HF an exception can be made within a Division. Consult your Mentor as to the requirements to be met.**

## 1.2 Code Of Good Practice For Safety In The Lab

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### General Principle

There are risks associated with any lab environment. Some of these are imposed by the chemicals or by the reactions between chemicals, which can be harmful to people and to the environment. Some are volatile or flammable.

**Thorough knowledge of the properties of the materials you use is essential in order to recognize and judge the risks and therefore prevent accidents.**

Following are some basic rules for good and safe lab practice. All personnel and students are expected to know and apply these rules. Most of them are purely common sense. **Blatant misbehavior will inevitably be sanctioned.**

### 1. Attitude

- Always be aware of potential risks involved with working in a laboratory.
- Apply the Code of Good Practice scrupulously.
- Avoid as much as possible initiating chemical reactions that will run overnight or during the weekend. The only exception to this rule are chemical reactions requiring more than a normal working day for completion. Do not leave an experiment unattended. If applicable, adhere strictly to the procedure "[Unattended Lab Experiments](#)" (Section 1.9).
- Never carry out experiments all by yourself.
- Know the properties of the products you work with. Get the necessary information beforehand from the KULeuven BIG-database <https://webwsp.aps.kuleuven.be/irj/portal/BIG>.

### 2. Hygiene

- Consumption of food, beverages or smoking is not permitted in a lab.
- Keep your lab coat closed at all times. Take off your lab coat when leaving the lab zone. This includes emergency evacuations.
- Always wash your hands with care when leaving the lab.
- Hair of greater than shoulder length is a hazard in the lab: tie it above the head.

### 3. Order and tidiness

- Keep hoods and lab tables clean at all times. Make sure all glassware is clean prior to leaving at night or for the weekend.

- Keep all recipients closed and put them back to where they belong after use. Store unused equipment in the proper location.
- Leave all unnecessary papers, books and writing materials as much as possible outside the labs and storage rooms.
- Keep floors free from pieces of glass, paper and wet spots to avoid slippage.

#### 4. Safety devices

- Always wear a lab coat, safety glasses and if necessary protective shoes. Open shoes are not allowed.
- Make use of other safety devices, such as hoods and gloves, dependent on the properties of the products and the handling instructions.
- Keep hoods closed as much as possible.
- Scarves are not allowed in the laboratory. For those that insist on wearing a scarf, fireproof specimens are available from the [HSE Department](#).

#### 5. Waste management

- Know how to manage your product consumption to minimize waste.
- Collect chemical waste in the appropriate vessels, identified by [color code and label](#) (Section 1.10). Follow the instructions supplied.
- When rinsing lab ware with water, always dispose of the first wash in the appropriate container for chemical waste. It is safe to discard the second wash in the sink.
- Always place waste vessels on leakage trays.
- Keep all containers for liquid and solid waste closed at all times. Use only the yellow caps with waste valve and the appropriate lids.
- Rinse waste laboratory glass before moving it to the laboratory glass container.

#### 6. Emergencies

- Alert supervising personnel of all accidents.
- Locate [fire extinguishers](#), [fire blankets](#), first aid kits, showers and eye wash stations, spill response kits, emergency exits before starting to work.
- React swiftly and appropriately in case of emergency:
- *First Aid*: Rinse burns by chemicals or extreme temperature differences with plenty of cold tap water for at least 15 minutes. If necessary use an eye wash station.
- *Spills of chemicals* (Section 1.8): Immediately remove spills following the appropriate procedure. Alert supervising personnel in case of large spills.
- *Fire* (Section 2.4): Alert everybody in the neighborhood. Make one attempt to extinguish the fire. Dial the Emergency Number **22 22**.

- Serious accident: Immediately dial the Emergency Number **22 22** .

## 7. Risk analysis

- Know beforehand the specific risks associated with your experiment . Prepare / consult the applicable risk assessment ([Section 1.1.](#))
- Scrupulously follow safety precautions.
- Immediately alert the supervising personnel if something goes wrong with your experiment.

## 8. Obligation of notice

- **It is everyone's duty to report to the Specialized HSE Contact, to the Mentor and/or to the Promoter whenever this Code gets infringed. An appropriate way is to use e-mail.**
- **In case no short-term solution is offered to the problem, the HSE Network Coordinator must be informed.**

## 9. Additional guidelines, relevant to the Department

- Make sure you understand the meaning of the [hazard class symbols](#) on the labels of the chemical recipients and of the warning signs used in the corridors.
- Be familiar with the [emergency procedure](#) (Section 2.3).
- Never pipette by mouth, no matter how harmless the liquid. Always use pipette filling bulbs.
- The use of water pumps to create a vacuum is strictly forbidden.
- Don't use flames close to volatile solvents.
- Use a balloon to close off all experimental set-ups. Do this as a routine measure, irrespective of whether the reaction requires an inert or special atmosphere.
- Never leave chemicals or solutions in direct contact with the ambient atmosphere. Always keep them in closed recipients. Target column chromatographic fractions must be evaporated as soon as possible. Waste fractions must be disposed of immediately in the applicable waste container. Close off columns that are left overnight or during the weekend. (The use of a balloon is recommended to prevent pressure buildup.)
- Do not leave (freshly purchased) chemicals in the lab. Store them in the storage rooms or in a ventilated safety cabinet.
- Avoid the use of contaminated heating oil for oil baths. Prevent chemicals from ending up in the heating oil. Immediately replace the oil in case of accident.
- The lab area should be cleaned regularly in accordance with the prescriptions of the applicable research group.
- Special regulations apply to activities beyond normal office hours. Consult [Sections 1.3](#) and [1.9](#).

## 1.3 Ventilation And Use Of Hoods

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### Ventilation

No experiments requiring human manipulation shall be carried out after office hours. Unattended lab experiments that occur in controlled circumstances and that comply fully with procedure " [Unattended Lab Experiments](#)" (Section 1.9) are exempt of this ruling.

Visit <http://www.chem.kuleuven.be/safety/info22.htm> for detailed information on the ventilation system layout and working regime. Rooms marked with a red dot are equipped with one or more hoods.

As a rule:

- **Laboratories** are ventilated (both air inlet and air exhaust) during office hours only, except those situated in the Central Area which are ventilated (both air inlet and air exhaust) permanently.
- **Laboratories** are void of ventilation (both air inlet and air exhaust) during weekends (from Friday 6.30 pm to Monday 8.00 am), on holidays and during periods of collective closure (e.g. Christmas – New Year), except those situated in the Central Area which are ventilated (both air inlet and air exhaust) permanently.
- On weekdays **laboratories** are void of ventilation (both air inlet and air exhaust) between 8.00 pm and 8.00 am and as of 6.30 pm on Fridays, except those situated in the Central Area which are ventilated (both air inlet and air exhaust) permanently.
- **Hoods** are exhausted during office hours only, except those situated in the Central Area which are exhausted permanently.
- **Hoods** in the Central Area are suitable for unattended experiments.
- In addition, some **hoods** are exhausted permanently (even when the area is under a reduced air inlet scheme after office hours) and are suitable to carry out chemical experiments not requiring human manipulation, i.e. unattended experiments, after office hours. These are marked with one red circle around the red dot on the maps.
- Laboratory 02.32 (Cyanide Room) is equipped with a dedicated separate ventilation system.

Handling chemicals inevitably invokes odor nuisance. No matter how strictly the chemist adheres to the "[Code Of Good Practice For Safety In The Lab](#)" (Section 1.2), incidental odor pollution cannot be avoided, if only because accidents can always happen. Attention reduces the risk, but does not eliminate it.

It is also obvious that odor contamination from the laboratories can cause nuisance in the **corridors** after 8.00 pm on weekdays (after 6.30 pm on Fridays). Take this into account and close all doors when leaving at night.

**It is therefore absolutely forbidden to carry out experiments involving human intervention and manipulation after 8.00 pm (after 6.30 pm on Fridays) and during weekends or on holidays.**

## Use Of Hoods

### General Principle

A hood is a transparent working space that can be isolated from the lab environment by means of a sash that can be raised and lowered. All hoods can be vented from the bottom also to remove fumes heavier than air.

### Procedure

- The sash shall be fully closed to its lowest position whenever the hood is not in use.
- Keep the sash at all times in the lowest position possible when manipulations are carried out. At the end of the experiment or whenever the experiment no longer needs manual intervention; fully close the sash again.
- Handle volatile or toxic solvents exclusively in the hood.
- Carry out any vaporization of solutions that generates fumes other than water vapor in the hood.
- Observe all experimental work from the outside. Never place your head in the hood in the course of an experiment.
- Keep the hood clean at all times. This holds especially when handling very hazardous carcinogenic, teratogenic and mutagenic products. Clean the bench upon completion of the experiment. Use a protective coating layer, such as Benchkote, if possible. The layer can be disposed of as Small Chemical Waste.
- A hood is a collective safety device for the people handling hazardous chemicals. As all vented fumes end up in the environment, emission of volatile products, and especially of halogenated organic compounds, should be reduced as much as possible by keeping recipients closed and by condensing fumes that escape during evaporation or distillation experiments as much as possible. Most organic compounds are absorbed by charcoal. Acid fumes can be neutralized in a scrubber. Mercaptans are a case in itself: their odor can result in gas leak alarms. Avoid accidental draining off in the hood's sink by placing the experimental set-ups in trays.
- A hood may not become a storage facility for hazardous products.
- A functional hood features an air flow of about 0.5 m/s measured at a sash opening of 35 cm as marked by the blue sticker. Notify your [Specialized HSE Contact](#) in case of doubt. An air flow meter is available to verify proper operation of the hood.
- Fix explanatory notes to the experiment to the sash.



## 1.4 Personal Safety Devices

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### General Principle

All employees and students must wear personal safety devices to eliminate or reduce labor risks. Always follow the guidelines of Good Laboratory Practice. Not only is this necessary, it is also mandatory by law.

### Personal Safety Devices

#### Applicable items

Gloves, respiratory protection, safety glasses, hearing protection, protection for head and face, ...

#### Acquisition

Ask your Promoter for your personal safety devices.

### Customized Safety Devices

#### Applicable items

Glasses for prolonged exposure to computer displays, customized safety glasses.

#### Acquisition

Ask your Promoter for your customized safety devices.

### Special Safety Devices

Special devices that are not on stock, such as glasses for glass workers, laser glasses, aluminum suits, woodcutter's outfits, shall be purchased and paid for by the requesting Unit. The [HSE Department](#) must be involved and will assist in the purchase.

## 1.5 Acquisition Of Chemicals

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All chemicals must be ordered through the Specialized HSE Contact responsible for the specific lab. Chemicals belonging to the Hazard Classes E3 and E4 can only be ordered after a Risk Assessment has been prepared. Consult Section 1.1 for more information on the Risk Assessment policy.

It is the purchaser's responsibility to fill out this form and hand it over to the Specialized HSE Contact for further processing.

For more information on the Hazard Classification, consult <http://chem.kuleuven.be/safety/HazClass.pdf>.

**The Department does not allow you to synthesize any chemical that is readily commercially available. Verify commercial availability prior to planning any synthesis of chemicals.**

## 1.6 Storage Of Chemicals

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### Introduction

These guidelines were developed based on the legal regulation and additional internal policies.

### Scope

This procedure covers the storage of

- all chemicals in laboratories - daily usage
- all chemicals in cabinets or storage areas – daily usage or stock

Not covered by this procedure are

- Gases
- Chemical waste
- Oils and fuels

### Procedure

#### Step 1: Reduction of stock

Limit storage of chemicals as much as possible by:

- Purchase of the smallest size recipients available.
- Purchase of the minimum quantities necessary using “just in time” principles.
- Timely disposal of chemicals no longer in use.
- Proper attention to storage of highly inflammable chemicals because of fire and explosion risks. Limit total storage of such chemicals to amounts below 50 liters to avoid the installation of a fire-proof cabinet or room. In addition when the capacity is kept below 50 liters no environmental license is required.

#### Step 2: Determination of facility needs

Dependent on the nature and the amount of the chemical following storage conditions prevail:

Chemical Property	Locked cabinet / storage area	Fire-proof	Permanent ventilation	Spill capture	Registry
<b>Liquid</b>					
(Highly) Inflammable		✓	✓	✓	
Explosive	✓	✓		✓	✓
Toxic	✓		✓	✓	
Oxidizing				✓	
Corrosive			✓	✓	
Drugs and psychotropic substances	✓			✓	✓
Precursors of drugs	✓			✓	✓
<b>Solid</b>					
(Highly) Inflammable		✓ <sup>**</sup>			
Explosive	✓ <sup>*</sup>	✓ <sup>***</sup>			✓
Toxic	✓				
Oxidizing					
Corrosive			✓		
Drugs and psychotropic substances	✓				✓
Precursors of drugs	✓				✓

\* Special storage conditions: follow "Procedure for explosives: acquisition, storage and performance of activities" (<https://admin.kuleuven.be/vgm/intranet/EN/explosives>).

\*\* Mandatory above 50 liters of inflammable chemicals. No storage in cellars.







\*\*\* Storage in fire-proof cabinet or room, in case of cooled storage in spark-free refrigerator.

## Points of interest

- Verify that all stored chemicals are compatible.
- Chemicals of strong odor must be stored in ventilated cabinets or rooms.
- Very small quantities of chemicals can be stored in the cabinets under the hoods. These cabinets are ventilated together with the hoods.
- Also chemicals not included in the table should be stored in dedicated cabinets or areas.

## Marking

Every door to a cabinet or storage area bears the appropriate safety marking.

Marking of the door to a storage area	Hazard symbol
No admittance, authorized personnel only	
No open flame	
Marking of the door to a storage area/storage cabinet if applicable	Hazard symbol
Inflammable	
Corrosive	
Poison	
Explosive	

## Spill capture

A chemical spill response kit is available for accidentally spilled liquids. Suitable means to limit spills include leak trays or special racks with built-in spill capture provisions. Leak trays can be used also on ordinary racks.

## 1.7 Labeling Of Hazardous Chemicals

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### General Principle

Through labeling of hazardous chemicals one can estimate the risk associated with their use in a fast and adequate way. Only when the potential risks are known one can take appropriate precautions.

### Procedure

#### The vendor

European regulation requires every vendor to label the products he sells. This label must provide information to help prepare a risk assessment. Without such assessment the product cannot be used. See also "[Handling Chemicals](#)" (Section 1.1).

With the release of CLP-Regulation (EC) No 1272/2008 the rules have been drastically modified. For an introduction to this new regulation [click here](#).

#### Self-labeling

All recipients for synthesized chemicals or for chemicals obtained through dilution or sampling must be labeled by the operator in accordance with the new [CLP-Regulation](#). Label design software is presently developed within KULeuven. Blank labels are available from the Central Warehouse.

Following rules must be followed:

- Attach the label such as to make it clearly readable when the recipient is stored.
- All information must be permanent, readable and firmly attached to the recipient.
- Attach the label to all recipients, if the chemical is spread over several recipients.

The label shall contain:

- The name of the chemical
- The applicable [Hazard and Precautionary statements](#), the applicable Signal Word and the applicable [symbol\(s\)](#)
- The name of the Department followed by "KULeuven"

#### Labels for chemical waste

The [HSE Department](#) labels all recipients for liquid chemical waste. Any recipient without such label has to be labeled in the lab. The labels can be

obtained from the [HSE Department](#). Consult "Collection And Storage Of Chemical Waste" (Section 1.10) for label identification.

Each label shows the name and number of the waste class , the hazard indications and the R- and S-phrases.

The person in charge of the lab marks the label with the Unit Number and the chemicals collected for waste of Classes 5 and 6.

### CLP Hazard class symbols

CLP prescribes new hazard symbols. Their previous CHIP equivalents are shown in gray if applicable.

1. Physical hazards: explosive, flammable, oxidizing, gases under pressure



2. Health hazards: corrosive, acute toxic, irritant, chronic toxic



3. Environmental hazards: ecotoxic



## 1.8 Spill Response

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### Classification of spills

Chemical laboratories use a wide range and relatively large quantities of hazardous substances and most laboratory accidents are caused by spilled chemicals. They therefore require preplanning to respond safely, swiftly and efficiently to chemical spills. Chemical spills and accidents need to be minimized as much as possible by developing the necessary spill prevention measures.

In the event of a spill, it is important to clean up immediately and to avoid spread of the release, irrespective of where it occurs. A quick response will help minimize potential harm to people, equipment and laboratory space.

The cleanup of a chemical spill should only be performed by personnel familiar with the hazards associated with the chemical. One should never proceed to clean up a spill if one is unsure of the correct method to use.

**A distinction must be made between minor non-emergency spills and major emergency spills. It is a good practice to always inform the Emergency Number 22 22 in case of doubt.**

- A **minor spill** (e.g., laboratory quantities of hazardous substances) is one that staff is capable of handling without external assistance.
- A **major spill** (e.g., fire, health or reactivity hazard; bulk quantities of hazardous substances) will likely require external assistance. Use the Emergency Number **22 22**.

Releases of hazardous substances that pose a significant threat to health and safety or that, by their very nature, require an emergency response regardless of the circumstances surrounding the release, or the mitigating factors are considered emergency situations.

The following constitute an **Emergency**:

- The situation is unclear to the person causing or discovering the spill.
- The release affects human health or is life threatening.
- The release requires evacuation of (part of) the building.
- The release involves or may lead to fire, explosion or other imminent danger.
- High exposure levels of toxic substances are present.

The following constitute a **Non-Emergency**:

- The person causing or discovering the spill understands the properties and the exposure level involved.

- The release can be appropriately cleaned up by lab personnel using available spill cleanup materials.
- The materials are limited in quantity, exposure potential, or toxicity and present only minor safety or health hazards to persons in the immediate work area or those assigned to clean up the activity.

Most laboratory spills classify as non-emergency and there is no need to call for emergency responders by dialing the Emergency Number **22 22**. One should however always inform the Unit Manager or the HSE Network Coordinator.

Most importantly, before attempting to clean up any spill, be sure it can be done safely. Always use the right personal safety equipment, including, at a minimum, appropriate eye protection, protective gloves, and a lab coat. Additional protective equipment may be required for spills that present special hazards (e.g. corrosive or reactive spills or spills that have a splash potential).

### Spill Prevention Methods

Laboratories seeking to minimize and prevent spills should focus on reducing the likelihood of spills and on minimizing spill damage. Note that the majority of chemical spills can be prevented or minimized by maintaining a neat and organized work area.

- Only involve the chemicals that are actually needed in the experiments;
- Only store chemicals that will be used within a reasonable period of time;
- Adhere strictly to correct chemical and experimental equipment choices;
- Never settle for inappropriate laboratory arrangements;
- Reduce clutter and unnecessary materials,
- Eliminate tripping hazards and other obstructions,
- Have all needed equipment readily available before starting work.
- Perform a laboratory procedure review prior to conducting new experiments;
- Keep reagent chemical containers sealed or closed at all times, except when removing contents;
- Use secondary containment to store and move chemicals.
- **All Mercury handling should occur over leakage trays.**

Laboratory spills can occur during a chemical's storage, transportation, or transfer, as well as in the actual experiment.

A spill prevention program for **storage areas** should include the following:

- sturdy shelves and properly designed storage areas to minimize breakage and tipping;
- chemicals stored by hazard class;
- larger containers stored closer to the floor;
- containers stored on shelves sufficiently away from the shelf edge to minimize the danger of falling;
- storage shelves with lips to reduce the danger of falling;
- leakage trays under containers as second containment measure;
- regular inspection of the integrity of containers.

To minimize spills during **transport**, the laboratory should invest in:

- carts, where appropriate,
- safety containers,
- straps to secure containers, and
- properly trained and thoughtful personnel.

During **transfer** of liquids from one container to another, the risk of spills can be reduced by:

- paying careful attention to the size of containers to avoid overfilling;
- using pumps or other mechanical devices rather than simply pouring directly into a container;
- providing spill containment to capture any leaks by appropriately using leakage trays;
- bonding and grounding containers when flammable liquids are involved.

## Emergency Spill Response Guidelines

- **Evacuate** - Stop work immediately and evacuate everybody from the spill area. Alert those nearby. Shut off electrical equipment while leaving. Use the nearest fire exit to evacuate. DO NOT use elevators.
- **Confine** - Isolate the spill area (e.g., close doors to the room where the spill occurred).
- **Report** - Dial the Emergency Number **22 22**.
- **Secure** - Until emergency response personnel arrives block off the areas leading to the spill. Do NOT go back into an area where a spill has occurred.

## Non-Emergency Spill Response Guidelines

- Close the laboratory door and increase ventilation (e.g., through the hoods) to prevent dusts and vapors from spreading to adjacent areas. Temporarily evacuate the room in the case of spills of HCl, HNO<sub>3</sub>, NH<sub>3</sub> or other volatile acids or bases. Other acid or caustic spills do not require evacuation.

- Limit access to the spill area to those involved in the clean-up process.
- Choose the appropriate personnel safety equipment. Always wear gloves and protective eyewear.
- Make use of the chemical spill response kit.
- Confine or contain the spill. Use absorbing paper to make a dike around the outside edges of liquid spills.
- Neutralize acid or caustic spills before disposal. Neutralize acids with  $\text{NaHCO}_3$ . Bases can be neutralized with diluted acetic acid. Get rubber boots and a gas mask before attempting to start neutralizing the spill. Act prudently: the neutralization process is often vigorous, causing splashes and yielding large amounts of heat. Monitor the neutralization process with pH paper. Once neutralized, rinse the residue down the drain with plenty of water.
- Cover/absorb liquid spills with absorbent (e.g., paper towels), working from the spill's outer edges toward the center and sweep/scoop residues into plastic bags. Additional packaging may be required before the wastes can be transported from the laboratory.
- If broken glass is involved, do not pick it up by gloved hands, use a scoop instead to place it in the bag.
- Clean the area and personal safety equipment with plenty of water.
- Further ventilating the spill area may be necessary. Open windows or use a fan unless the area is under negative pressure.
- Dispose of waste as Chemical Waste Class 6. For mercury-containing waste, a specific procedure must be followed (see next page).
- Decontaminate the spill clean-up tools. Remove all gross contamination with a wet paper towel. Dispose of the contaminated paper towels as Chemical Waste Class 6. Rinse the tools off with copious amounts of water. If necessary, dispose of the gloves as Chemical Waste Class 6. Dry the tools off and place back into the spill kit along with the safety equipment used. Do not forget to obtain replacement gloves and spill clean-up material.

### Special Precautions For Spills Of Hazardous Chemicals

Some spills may require additional precautions to be taken due to the special hazards involved. Note some chemicals may exhibit more than one characteristic. Act accordingly.

#### a. Flammable Liquids

- Remove all potential sources of ignition.
- Temporarily evacuate the room.
- Equip yourself with rubber boots, a gas mask and chemically resistant gloves.
- Before resuming work, make sure the spill area has been adequately ventilated to remove flammable vapors.

### b. Volatile Toxic Compounds

- Temporarily evacuate the room.
- Equip yourself with rubber boots, a gas mask and chemically resistant gloves.
- Before resuming work, make sure the spill area has been adequately ventilated to remove toxic vapors.

### c. Direct Contact Hazards

- Carefully choose suitable personal safety equipment. Make sure that no skin is exposed and that the gloves protect against the hazards posed by the spilled chemical. Often it is a good idea to wear two sets of gloves: one as the primary barrier, the second as a thin inner liner in the event that the primary barrier fails.
- When the cleanup is completed, be sure to wash your hands and other potentially affected skin surfaces.

### d. Mercury Spills

- Mercury spills rarely present an imminent hazard unless the spill occurs in an area with extremely poor ventilation. The main exposure route of mercury is via vapor inhalation. Consequently, if metallic mercury is not cleaned up adequately, the tiny droplets remaining in surface cracks and crevices may yield toxic vapors for years.
- Cordon off the spill area to prevent people from inadvertently tracking the contamination over a much larger area.
- Use an appropriate suction device to collect the big droplets. DO NOT use a regular vacuum cleaner: it will disperse toxic mercury vapors into the air and the vacuum cleaner becomes contaminated. Pay attention to collect ALL visible droplets. Self-adhesive tape may come in handy to collect droplets difficult to reach. This may seem like a tedious procedure, but applying it correctly is the only way to prevent future health problems.
- Powder the cordoned off spill area with flowers of sulphur. Sulphur reacts with any remaining traces of mercury, so as to assist with decontamination and to reduce the vapor hazard. Allow the sulphur sufficient time to amalgamate with the mercury (about 24 hours).
- Sprinkle the powdered area with water and use a scoop to mix the residue into a paste.
- Collect all spilled mercury and the paste residue in closed glass recipients. Dispose of as Mercury Waste.
- Thoroughly wash the spill area with copious amounts of water. The use of a 20% solution of sodium thiosulphate may be considered for more complex situations.

## Documentation Of The Spill

After cleaning up a spill, a simple report should be prepared to document what happened, why, what was done, and what was learned. Such documentation can be used to avoid similar instances in the future or to resolve the spills more efficiently. A copy of the report must be presented to the HSE Network Coordinator.

## Water Spills And Gases Leaks

Water spills can be caused by loose connections or breaks in lines to water condensers or cooling systems. Such spills can cause damage and inconvenience, even if they do not present environmental or health risks. Appropriate planning, including use of security clamps or other devices to prevent loosening of connections or automatic shut-off devices, can reduce the likelihood of flood damage. Planning to prevent damage from incidents should include the protection of instruments that might be damaged by water. Similarly, storing chemicals and supplies so that they will not come into contact with leaking water will minimize damage and inconvenience.

Laboratories using gases should also develop leak prevention plans for these materials. Gas bottles must be secured at all times to avoid falling over. Additionally, frequent checks of valves and tubing can be useful in spill and leak prevention. A laboratory should take care to prevent gas from escaping down a drain or up a fume hood. Consult [Section 1.21](#) for additional safety rules for handling gas bottles.

## Recommended Components of a Laboratory Chemical Spill Response Kit

Every laboratory working with hazardous chemicals should have ready access to a chemical spill response kit. Identify its location in the neighborhood of your lab.

As a minimum, such a kit should contain:

- at least 2 splash resistant goggles
- at least 2 pairs of chemically resistant gloves (nitrile)
- at least 2 pairs of rubber boots
- at least 2 universal gas masks
- paper towels (enough for a 10 liters spill)
- neutralizers ( $\text{NaHCO}_3$  powder and diluted acetic acid)
- finely divided sulphur powder
- plastic bags
- mop and bucket
- small/large broom
- anti-static plastic scoop and dust pan (polypropene)

## 1.9 Unattended Lab Experiments

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### Introduction

“Unattended” activities are defined as **all non-supervised activities**.

Despite all properly taken precautions, unattended experiments/activities (during or beyond normal working hours) can go wrong. To limit the damage, the First Intervention Teams must have access to accurate information regarding such activities and the people responsible.

### Scope

This procedure applies to all unattended experiments/activities (during and beyond normal working hours) AND that pose a potential hazard.

### Procedure

An **Obligation To Declare** applies to all unattended activities. This means:

- All necessary information concerning the activity must be clearly displayed on the entrance door to the room AND
- All necessary information must be submitted to the Central Dispatch ([CentraleDispatch@tech.kuleuven.be](mailto:CentraleDispatch@tech.kuleuven.be)) and the [HSE Department \(vgm@kuleuven.be\)](mailto:vgm@kuleuven.be).

### Step 1: Precautions

Make sure all necessary precautions have been taken to allow for unattended execution of the activities/experiments. Your Specialized HSE Contacts or the [HSE Department](mailto:vgm@kuleuven.be) can offer useful advice and support in this matter.

### Step 2: Declaration Form

Inform the Specialized HSE Contact Chemical Safety / Electromechanical Safety about any upcoming unattended activity. He/she will take care of the declaration through the HSE Network Coordinator.

Completely fill out the [NOTIFICATION: Continuous activities – unattended \(continuous experiments\)](https://admin.kuleuven.be/vgm/intranet/EN/Documents/unattendedexp.doc) (<https://admin.kuleuven.be/vgm/intranet/EN/Documents/unattendedexp.doc>) mentioning:

- At least 1 contact and the applicable phone number(s).  
**Note:** At least 1 contact shall be available permanently.
- All risks and hazards applicable.
- All precautions to be taken in case of disturbances or accidents, such as power loss, water supply interruption, etc.

**Fix the form to all access doors to the room.** For larger rooms or shops also display the form close to the experimental set-up.

### Step 3: Submitting The Form

**Prior** to starting any unattended activity (if possible 2 working days in advance) mail the Declaration Form: Unattended Experiments to the Central Dispatch ([CentraleDispatch@tech.kuleuven.be](mailto:CentraleDispatch@tech.kuleuven.be)) and the HSE Department ([vgm@kuleuven.be](mailto:vgm@kuleuven.be)).

Copy the Unit Manager, the HSE Network Coordinator and the Specialized HSE Contact.

### Points Of Interest

**Prior** to starting up unattended experiments, all proper precautions have to be taken to warrant safety.

Amongst others verify the following danger areas:

- (temporary) power loss or interruption;
- interruption in the supply of or loss of compressed air;
- interruption or loss of gas supply;
- interruption or loss of water supply;
- ventilation available beyond normal working hours;
- interruption or loss of ventilation;
- defects in the monitoring, detection or data acquisition systems;
- leaks of gases or liquids.

Possible precautions include:

- circuit breakers, surge arrestors and the like;
- safety thermostats;
- automated fire extinguishing systems;
- safety valves;
- proper grounding of electrical devices;
- ...

## 1.10 Collection And Storage Of Chemical Waste

This procedure applies to the collection and storage of all waste generated when handling chemicals.

The disposal of gases forms no part of this procedure.

### Selective collection of chemical waste

- Limit chemical waste in the labs.
- Minimize the amount of chemical waste by reducing the amounts of chemicals used as much as possible (small scale experiments, appropriate techniques,...). NEVER discharge any chemical waste. Move full waste recipients ASAP to the central waste areas and have them removed from there regularly.

*Chemical waste is categorized in following classes:*

Physical State	Type of Waste	Label
Liquids	Class 1: Acid Inorganic Liquid Waste	<p>Product: <b>LEUVEN</b> Overzinger: van Gansbeke NV  <small>Leuvensesteenweg 7 3000 Leuven</small> Afsvalcode: 301001  <b>UN 3264</b> ADR sticker klasse: 8  <b>CHEMISCH AFVAL</b>          Categorie 1  <b>Zure Anorganische Afvalvloeistoffen</b>  <b>Acid inorganic liquid waste</b>          Deelnummer: Afsval: <small>Productcode: 0000</small>  <b>8</b> <small>Corrosive</small>          Voorzamen brandwonden          Schadelijk, gepneumiseerd ernstige schade aan de gezondheid bij langdurige blootstelling bij inademing, ernstig met de huid en slijmvlies door de mist</p>
	Class 2: Alkaline Inorganic Liquid Waste	<p>Product: <b>LEUVEN</b> Overzinger: van Gansbeke NV  <small>Leuvensesteenweg 7 3000 Leuven</small> Afsvalcode: 302001  <b>UN 3256</b> ADR sticker klasse: 8  <b>CHEMISCH AFVAL</b>          Categorie 2  <b>Basische Anorganische Afvalvloeistoffen</b>  <b>Alkaline inorganic liquid waste</b>          Deelnummer: Afsval: <small>Productcode: 0000</small>  <b>8</b> <small>Corrosive</small>          Voorzamen brandwonden          Schadelijk, gepneumiseerd ernstige schade aan de gezondheid bij langdurige blootstelling bij inademing, ernstig met de huid en slijmvlies door de mist</p>

Physical State	Type of Waste	Label
Liquids	Class 3: Non-Halogenated Organic Liquid Waste	
	Class 4: Halogenated Organic Liquid Waste	
	Class 5: Special Liquid Waste	
Liquids and/or solids	Class 6: Small Chemical Waste (KCA)	
Solids	Class 7: Laboratory Glass	

In addition special procedures apply to specific waste streams.

**For instructions per waste class consult**  
<http://www.chem.kuleuven.be/safety/waste.htm>

***Following rules apply to the waste collection:***

- Properly label all waste containers using the appropriate waste identification labels.
- The waste producing entity (user / unit) remains responsible for the proper disposal in accordance with the abovementioned classes.
- The waste recipients capacity shall be adequate for the amount of waste produced. Recipients shall never exceed 5 years of age.
- Only recipients available centrally shall be used.
- Every recipient shall be identified appropriately (label mentioning waste class and unit number).
- All recipients shall be undamaged and clean on the outside.
- Never fill the recipients completely. Always leave at least 5 centimeters of clearance between the liquid level and the top of the recipient.

## 1.11 Handling Gas Bottles

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### Transport of gas bottles (full and empty)

- Use appropriate gas transport carts
  - Trajectory does not hold any stairs: bottles should be moved using a gas bottle cart having the bottle secured through a chain.



- Trajectory does hold stairs: bottles should be moved using a 3-wheeled gas bottle cart having the bottle secured through a chain.



- Gas bottle transport is allowed during working hours only. In exceptional cases where transport is necessary outside the normal working hours, the presence of a second person is mandatory.
- Always keep the safety cap in place in order to protect the main valve.
- Make sure the bottles are always secured in place by chains or braces during the entire transport.
- No other person than the one transporting the gas bottle may accompany the bottle in an elevator.

### Connecting gas bottles

- Gas bottle connections shall be executed by authorized personnel only.
- Gas bottle connections shall be executed during working hours only. In exceptional cases where connections must be made outside the normal working hours, the presence of a second person is mandatory.
- Always use the appropriate regulator having the right thread and size to directly fit the valve. Avoid the use of couplers.
- It is forbidden to use couplers in high pressure applications (> 15 bars).
- Always secure gas bottles using metal braces.

## 1.12 Handling Cryogenic Fluids

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### Hazards related to the use of cryogenic fluids

#### Fire hazard

Liquid nitrogen (b.p.  $-198^{\circ}\text{C}$ ) readily absorbs air oxygen (b.p.  $-183^{\circ}\text{C}$ ), leading to an explosive mixture as of 8% oxygen content. This process is visible as the mixture turns blue. Therefore refresh liquid nitrogen regularly and empty open dewars before leaving at night to avoid such hazard.

#### Pressure hazard

Cryogenic fluids are stored at temperatures close to their boiling points. Every container therefore contains an appreciable amount of gas also. The volumetric expansion ratio from liquid to gas can create serious pressure build-up if no proper check valve is available. Direct sunlight or the presence of heating elements may aggravate the situation.

#### Physical hazard

Direct contact with the liquid or the materials containing it can result in severe frostbite. Prolonged contact leads to embrittlement of the affected body parts, as the water in the cells freezes. Especially eyes are very vulnerable. The use of eye or facial protection is mandatory.

Commonly used cryogenic fluids are not toxic. Yet they can lead to respiratory problems when they deplete the oxygen in the surroundings. Adequate ventilation is always a must.

Cold nitrogen is heavier than air and may accumulate in the lower parts of the room.

### Precautions and procedures

#### Personnel

Handling of cryogenic fluids must be accomplished with a minimum of personnel, yet an assistant is mandatory to assure immediate assistance in case of emergency.

#### Personal safety devices

- Eye protection (at least glasses) is mandatory.
- Always wear gloves when picking up dewars or other recipients or when touching cold metal surfaces. Use gloves that are impenetrable and provide sufficient thermal insulation. Don't let them fit too tight: in case of emergency they must be removed easily and rapidly.
- Whenever the risk for physical contact is present (e.g. when filling up dewars) the following devices must be used also:
  - Full facial screen instead of glasses
  - Impenetrable apron (acid resistant lab coats are suitable)

- Proper gloves
- Proper shoes that can keep the liquid out

It is absolutely forbidden to wear watches, rings or other jewelry when handling cryogenic fluids. No objects that might trap cryogenic fluids in close contact with the skin may be worn either.

### Storage areas and labs

- Storage areas for cryogenic fluids must be dry, well ventilated and free of heat sources, including incident sunlight.
- Whenever cryogenic fluids are transferred from the storage tank into transport dewars, the area must be well ventilated.
- All labs where cryogenic fluids are used must be well ventilated.
- Never use polystyrene boxes when handling cryogenic fluids.

### Equipment

- Closed systems and vessels must be provided with an aluminum waste valve. Transport dewars must in addition be provided with a manual valve to release the pressure prior to transport. Proper maintenance must be assured to warrant decent functionality.
- All equipment and systems must be kept clean scrupulously.
- Open recipients must have a floating lid to release any pressure build-up and to avoid oxygen or moisture ingress into the fluid. Ice clogging up the dewar neck may be the cause of serious trouble.

### Internal transport

- Never use your own car to transport cryogenic fluids between two buildings.
- Never accompany a transport dewar in an elevator. Any internal transport involving the use of elevators requires the presence of two people: the first person puts the transport dewar in the empty elevator and sends the elevator to the reception floor. He/she will not accompany the dewar. At the receiving end a second person will take the dewar out of the elevator and move it to its final destination.

### Emergencies

- Immediately clear the room whenever recipients with cryogenic fluids start leaking. Lock off the room. Allow for sufficient ventilation before re-entering the room. For severe leaks, have the oxygen content checked prior to re-entry.
- Unconscious people in rooms where cryogenic fluids are being used may be approached only by people wearing self-sustaining gas masks, unless a measurement of the oxygen level indicates it is safe to enter the room. It is a golden rule to protect oneself first before helping others.
- Frostbite caused by cryogenic fluids must be treated like burns. Disclose the true nature of the wounds to the physician.

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## 2 Emergency Situations

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## 2.1 Warning Alarm And Evacuation Alarm

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### Warning Alarm and Evacuation Alarm

The sounding of the warning or evacuation alarm triggers a series of actions that can occur successively or simultaneously.

- **Warning Alarm**
  - A **3 second** siren or direct human notification.
  - Notification of fire detection.
  - Mobilization of the First Intervention Team to execute the appropriate procedure.
  - **A warning alarm is not a command to evacuate!**
- **Evacuation alarm**
  - An uninterrupted **5 minute** siren or direct human notification.
  - **General command** to immediately evacuate the premises and to assemble on the parking lots of the Chemistry Buildings.

### Manual activation of evacuation alarm



Uninterrupted 5 minute siren following triggering via the pushbutton.

This alarm is a command to **immediately evacuate the premises**. Follow the [evacuation procedure](#) (Section 2.3).

The First Intervention Team, wearing yellow fluorescent jackets, supervises the evacuation. Follow their instructions.

The siren stops automatically after 5 minutes. Never reset the system!! Everybody should remain at the assembly point, even after the sirens stopped, until instructed to return by the authorized personnel!

The First Intervention Team

- gathers everybody at the assembly point.
- informs the external emergency services.
- guards all entrances so as to avoid premature entering of the building; entrance is allowed only upon approval by the Emergency Teams.



## 2.2 Emergency Calls And Emergency Number

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### General Principle

Giving swift and efficient assistance in emergencies is essential. The emergency number **(32) 22 22** is available 24 hours a day. Notification of an emergency can also be given via e-mail ([Noodnummer@kuleuven.be](mailto:Noodnummer@kuleuven.be)).



**Always use this number. Never call the Fire Department or the 100 Service.**

Only use this number in cases of emergency, such as:

- Detection of an uncontrolled **fire** or of unacceptable smoke (Section 2.4)
- If the building needs to be **evacuated** (Section 2.3)
- Need for urgent medical care and/or an ambulance
- Detection of a suspected explosive device
- An explosion
- A severe accident
- Fights, burglary,...
- The presence of suspicious people or situations
- In situations that require immediate emergency intervention

### Why?

Alerting the KULeuven Emergency Center has two advantages:

- The emergency intervention services will receive all additional information
- The assistance teams at KULeuven are immediately informed and can render more efficient support to these services.

In most cases the KULeuven teams can intervene sooner than any external emergency service.

## Procedure

- Dial **22 22** on internal phone set(s) or **016/32 22 22** on your mobile.
- Provide following information:
  - Your identity and function
  - The location of the building
  - The floor and if possible the room number
  - The reason for your call

Please remain at the disposal of the intervention teams. **Do not leave the scene without their approval, unless you consider yourself to be in danger.**

## 2.3 Instructions For Evacuation Of The Building

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### Evacuation Command Initiation

1. Assess the situation! Is it necessary to evacuate?
2. Hit the pushbutton to activate the alarm!
3. Always inform the Emergency Center at **22 22!**
4. Provide following information:
  - Your identity and function
  - The location of the building
  - The floor and if possible the room number
  - The reason for your call



**Evacuation is serious business. Do not activate the alarm "just for fun"!**

### Evacuation Procedure

The procedure for evacuation becomes active whenever **the alarm sounds for more than 3 seconds.**

- Call the **Emergency Center!**
- Immediately switch off all electrical apparatuses (*Especially computer displays, heaters, aircos, etc.*) .
- Lighting must remain on.
- Make sure ongoing lab experiments will not aggravate the situation.
- Cut water (when safe) and gas supply.
- Close all windows and doors.
- Evacuate the building via the **normal exits**. (*Don't forget coats and wallets / purses*) *People in charge of groups of students or visitors are responsible to have their group clear the premises. Verify the presence of each member at the assembly point. Notify the Intervention Team or the Emergency Teams whenever somebody is missing.*
- **Never use elevators!**
- Move ASAP to the assembly point on the parking lot of the Chemistry Buildings.
- Await further instructions.
- Keep all access roads to the building clear to facilitate the intervention by the Fire Department and other emergency services.
- Do not enter the building without permission.
- Inform the Emergency Teams of the presence and location of missing people and/or of wheel chair patients and their companions.

- The assembly point is marked by this sign:



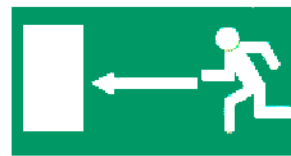
- Leave the building using the **standard exits**:



- If fire or smoke blocks the normal exits, use the **emergency exits**. These are marked by the following warning signs:



Location of emergency exit



Direction to emergency exit

## Evacuation For Persons Confined To Wheel Chairs

1. Situational awareness is of the essence! (*Position in the building and presence of alternative exits*)
2. Do not use elevators in case of fire.
3. When in danger immediately go to a 'safe' area with access for external evacuation (different fire zone) at the same floor. Wait for assistance.
4. Make sure you are accompanied by **one** person.
5. Make sure both presence and location is transmitted to the Intervention Team or the Emergency Teams.
6. Await further instructions from or evacuation by the Emergency Teams.

## Building Evacuation Exercises And Alarm Tests

- During **building evacuation exercises** all steps in the procedure are meticulously followed. Even though there is no life threatening danger involved, everyone is obliged to participate in the exercise and to strictly follow the routine explained in the procedure.
- **Testing of the alarm system** can be ignored. The alarm signal will sound in short bursts, not continuously.

## 2.4 How To Act In Case Of Fire

### General Principle

Fire extinguishing is always a battle against time. A fast and efficient reaction is of the essence to secure your own safety and that of the people in the building. Swift notification of those close at hand and of the intervention teams (both internal and external) is very important. Many buildings already have their own trained Intervention Team.

The Intervention Team can be considered a First Aid in case of Accident. Members of the Intervention Team wear fluorescent yellow jackets in case of emergencies.

#### Internal Emergency Services

- Intervention Team
- Campus Security
- Technical Services
- [HSE Department](#)

#### External Emergency Services

- Fire Department
- 100
- Police

### Procedure

#### 1. Call "FIRE FIRE"!

This alerts people in the close vicinity. Now several tasks can be executed simultaneously.

When no help is at hand: Immediately activate [evacuation alarm](#) (Section 2.1) by pushing the evacuation button.



#### 2. Make one attempt to extinguish the fire

An emerging fire can often readily be extinguished. As time goes by, the difficulty level however increases dramatically. Try to fight the fire with a fire extinguisher.

**Noodgeval? Emergency?**

016 32 22 22

KATHOLIEKE UNIVERSITEIT  
**LEUVEN**

[www.kuleuven.be/noodnummer](http://www.kuleuven.be/noodnummer)  
[www.kuleuven.be/emergency](http://www.kuleuven.be/emergency)

### 3. Dial or have the emergency number dialed to alarm the Emergency Center

Provide following information, clearly and slowly:

- Your identity and function
- The location of the building
- The floor and if possible the room number
- The reason for your call

Never call the local Fire Department itself. Always alert the **KULeuven Emergency Center 22 22**.

### 4. The extinguishing attempt failed / succeeded

- When the extinguishing attempt **fails**
  - Immediately activate **evacuation alarm** (Section 2.1) by pushing the evacuation button!
  - Dial the Emergency Number and report the evacuation
  - Go to the assembly point and await the Emergency teams to give them the necessary information.
- When the **fire is out**
  - Await the Emergency Teams on the spot.
  - Give them the necessary information for them to carry out their duties.

**The door to every room has the evacuation procedure attached to it. Familiarize yourselves with the instructions.**

### Useful tips

- Fire fighting equipment:  
Familiarize yourselves with the **location** (Section 2.5) and the use of the fire fighting equipment in your neighborhood. Corridors and staircases are the preferred locations.
- Fire doors:  
These doors are designed to resist fire and smoke. Keep them closed at all times. Some types of fire doors are activated magnetically in case of fire. Never obstruct their closing radius.
- Don't leave about any junk. Have waste collected regularly!
- Familiarize yourselves with the members of the Intervention Team that are responsible on the floor where your lab(s) are situated.



## 2.5 Summary And Location Of The Fire Fighting Equipment


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The Institute for Chemistry Research, Celestijnenlaan 200F, is equipped with the following fire fighting devices:


- fire hose reels
- fire blankets
- fire extinguishers

The exact location of these devices is shown on the building plans at <http://www.chem.kuleuven.be/safety/info15.htm>. Familiarize yourself with these locations.



**Fire hose reels** are located in the entrance halls at both extremities of the building and centrally in all main corridors. They are marked with the standard sign, as depicted to the right. They are marked with the symbol  on the plans.






**Fire blankets** are available in the vicinity of all high risk rooms. They are marked with this sign. On the plans their location is indicated with the symbol  .





**Fire extinguishers** have been assigned historically to those rooms with increased need for fire fighting capacity. To obtain more transparency regarding the location of the fire extinguishers - both for users and the controlling organism -, the extinguishers were grouped into so-called fire extinguisher pools. This picture shows one such pool.

Most of the fire extinguishers are placed well in sight in the corridors and next to the entrance doors to the rooms.


Different types are marked with the symbols ,  or  on the plans.

Every floor, with the exception of the basement, contains four primary ex-

tinguisher pools, located at the extremities of the main corridors, close to the fire doors. Every pool is equipped with one powder and two CO<sub>2</sub> extinguishers. They are marked with the symbol  on the plans.

Two more CO<sub>2</sub> extinguishers are placed in every central fire hose reel cabinet. The symbol  is used on the maps. As these devices are out of sight, their location is marked with this sign:



This holds also for the powder extinguishers in the fire hose reel cabinets next to the elevators in the main hall. These are marked with the symbol  on the plans.

In addition, selected high-risk rooms, such as storage areas for chemicals, didactical labs or rooms used intensively for synthesis, are provided with extra fire extinguishers.

**Familiarize yourself with this line-up and verify whether your room is equipped with its own extinguisher.**

It is recommended to use CO<sub>2</sub> extinguishers whenever possible in light of the tedious and expensive clean-up procedures for fire extinguisher powder. Powder extinguishers should be used only when CO<sub>2</sub> is not an option, as e.g. in case of a fire in the Cyanide Room or when metal fires occur. Metal fires must be treated with special metal extinguishers..

Guidelines on the use of extinguishers can be found at <https://admin.kuleuven.be/vgm/en/HSEEmergencyFireFighting.html> and at <http://www.chem.kuleuven.be/safety/liab6.htm>.

## 3 The Health & Safety Website

For more information and guidance in specific situations or for specific chemical handling, consult the Departmental website at <http://www.chem.kuleuven.be/safety>.

HOME WHO IS WHO NEDERLANDS

KATHOLIEKE UNIVERSITEIT LEUVEN Department of Chemistry Health, Safety and Environment



- A Creative Approach To The Chemist's Liability
- Waste Collection
- Emergency Procedure
- Procedures
- Info
- Forms
- Services
- MSDS
- Search
- Relevant Websites

• K.U.Leuven Database "Hazardous Products"

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### Declaration Of Openness

#### Safety and environmental awareness in dealing with chemicals

K.U.Leuven's Department of Chemistry arranges the education programs for chemists. These comprise acquiring and practicing the apprehension and insight in the structure and the properties of matter. This implies also imparting the necessary attitudes, knowledge and skills to handle chemicals in a safe and environmentally justified way in a lab environment.

Watching over the correct use of chemicals by people on the job site or in the close vicinity is unmistakably an integral part of the professional duties of a chemist. He/she is supposed to be an expert in the field of chemicals.

Potential risks in connection with chemicals must be acknowledged objectively. All necessary precautions have to be taken in order to prevent these substances from endangering the environment and the health of others in the unlikely event of their spreading outside of the laboratories.

The Department of Chemistry warrants that all personnel and all students – in collaboration with the Health, Safety and Environment service (HSE) of K.U.Leuven - receive the necessary scientific and social education to allow them to act as reliable experts in a safe and environmentally friendly handling of chemicals in laboratories, both in the course of their training and later in their professional career.

The Department of Chemistry of K.U.Leuven expects that all personnel and students follow the applicable rules (see [circular rector and general manager](#)) at all times and immediately report abuse, offences or slovenliness to the departmental HSE antenna, manager or chairman of the department.

Prof. Luc Van Meervelt  
Chairman

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*This brochure provides the most recent information available from the Department of Chemistry of KULeuven during the 2010-2011 academic year. However, changes to the procedures may be approved after the publication of this brochure. In no way is the university legally bound by the information provided in this brochure. The most recent information on all applicable procedures can be consulted on [www.chem.kuleuven.be/safety/](http://www.chem.kuleuven.be/safety/).*

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