Internal safety regulation
DBMV and DEE

Prepared by América Fariña (April 2010)
Internal safety regulations of DBMV

Translated by Andrea Finka (2008)
GENERAL

In the laboratories, the work of scientific and technical personnel represents certain risks, which are important to know and understand.

The aim of these regulations is to draw the attention of the personnel of DMBV to the dangers and of risks that can frequently occur in the laboratories.

In general, the scientific and technical personnel are primarily confronted with the dangers resulting from (mis)handling of cryogenic fluids, biological and chemicals solvents; to these dangers one must add the usual electric risks, explosion and fire accidents.

FOR ANY EMERGENCY

CALL «115» 24 hours/days

LIABILITIES

PERSONAL LIABILITIES: EACH MEMBER OF DBMV TAKES CARE TO ENSURE HER/HIS SECURITY AND THAT OF HER/HIS ENTOURAGE. IT IS SUPPOSED TO KNOW THE VALID SAFETY REGULATIONS AND TO APPLY THEM.
THE LEADER OF EACH RESEARCH GROUP IS RESPONSIBLE FOR THE SAFETY IN HER/HIS OWN LABORATORY.
THE LEADER OF EACH RESEARCH GROUP MUST MAKE SURE THAT HER/HIS COLLABORATORS RESPECT THE SAFETY REGULATIONS.

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SAFETY IN THE LABORATORY

These general procedures of safety apply to any person, who works in the laboratories of the DBMV and DEE

1. GOOD PRACTICES IN THE LABORATORY

In the laboratory, it is prohibited:

• to smoke, drink, eat, pipette with the mouth
• to store food in the refrigerators (cold room)

It is obligatory:

• to use the protecting material (lab coat, gloves, glasses…)
• to take off yours gloves whenever you necessitate displacement out of the laboratory (i.e. before use the telephone handset, before the opening of doors, before the use of keyboard data, before the use consultation of book or paper, and so on.
• to work under a hood with the toxic or volatile products in a suitably ventilated room
• to store the volatile products far from the sources of heat
• to carry out handling with genetically modified micro-organisms and the genetic transformations only under the hoods with laminar flow.
• to disinfect the hoods with laminar flows before and after uses and to clean them of any dirty material.
• to respect the instructions of waste management.

It is desirable:

• to work in somebody’s presence during night hours and weekends.
• to work with equipments that are in good state (any anomaly must be reported to the person in charge).
• to wear spectacles (glasses), but not contact lenses.
• to protect the eyes with goggles while working with UV
• to wear low-heeled and closed shoes
Utilizing biological and/or chemical products in the laboratory

• Make a stock of the products that are frequently used for current experiments.
• Stock up only limited quantities of these products.
• Clearly label the solutions: name and concentration of the product, solvent, name of preparer and date.
• Arrange chemicals by families; they should be correctly identified according to their risks and of their chemical behavior.

Incompatibility of the products

Incompatible products will be stored separately.

Source: http://www.cusstr.ch/produits chimiques/annexes

Transport of products

Do not ever carry dangerous material by the hands

Transport the material and the bottles (acid, solvents, medium, etc.,) in a suitable container (storage bin, box, plate….)
**Spill of liquids**

Every laboratory frequently using chemical substance has at least one emergency set including:

- A container with a universal absorbent (convenient for solvents, oils, acids, bases)
- Two pairs of highly protective gloves
- Two protective mask with universal filter (Do not use in case of fire)
- A brush

**Procedure**

- Pour a layer of absorbent on the spill (5mm).
- Let it absorb for a few minutes.
- Using the highly protective gloves (eventually a protection mask and a brush, collect the used absorbent and pour it into a container.
- Label the container according to labeling rules.
- Treat the used absorbent as a special waste.
- Inform your safety delegate and announce the case on “Event announcement”

**Protection during and after pregnancy**

The protection of pregnancy and maternity is an important concern of the UNIL. All the possible measures are taken in presumption of danger to the health of the mother and the child. Since 2001 in Switzerland, the expectant mothers has increased protection of health in relation to pregnancy and maternity. These requirements are derived from the Ordinance of the DFE on dangerous or painful activities during pregnancy and maternity. (March 2001, RS. 822.111.52)

**Potential hazards**

The following activities are strictly prohibited for expectant or breast-feeding mothers:

- Exposure to chemical substances with risk phrases: R26, R27, R28, R39, R40, R45, R46, R49, R60, R61, R62, R64, and R68.
- Activities with ionizing radiation.
- Activities with magnetic fields higher than 5 Gauss.
- Activities with Group2 micro-organisms and higher.
• Carrying regularly loads heavier than 5 kg and occasionally more than 10 kg.
• Activity at temperatures lower than -5°C or higher than 28°C

This list is not exhaustive. Other hazards are subject to a particular risk analysis of the workplace and activities of the employee

_We remind you that the first months of pregnancy are the most critical._

Ordonnance du DFE sur les activités dangereuses ou pénibles en cas de grossesse et de maternité (réf. 822.111.52)

Commission universitaire pour la santé et la sécurité au travail romande
[http://www.cusstr.ch/repository/35.pdf](http://www.cusstr.ch/repository/35.pdf)
CHEMICAL PRODUCTS: LABELING CHANGE

All chemicals may present a danger.

In Switzerland, the use of chemical substances is principally ruled by:

- the Law on chemicals products (LChem RS 813.1)
- the Ordinance on chemical products (OChem RS 813.11)
- the Ordinance on the decrease of risk relative to the chemical products (ORRChim RS 814.81)
- the Law on environment protection (LPE RS 814.01)
- the threshold limits values at working poste, SUVA

The Law on chemical products (LChim) stipulates that the user is responsible for taking into account the safety information given by the supplier and taking the appropriate measures to protect himself, the work area, and environment against the dangerous properties of the compounds being used.

The Ordinance on chemical products (OChem) specifies which safety information has to appear on the labels as warning symbols, according to criteria of dangerous physico-chemical or toxic effects.

In 2009, a new system of classification of hazards and safety labeling known as the Globally Harmonized System (GHS) was introduced and based on UNO recommendations. GHS aims to harmonize worldwide the labeling of chemical including transportation.

**By the end of 2010, suppliers will entirely replace the current labeling for pure substances and in 2015 for mixtures**

Visit the following link for more details about GHS:

2. CHEMICAL RISKS IN THE LABORATORY

2.1. Properties of substances

Chemicals that are likely to present danger can be related to:

- their physical properties: inflammability, explosiveness
- their chemical properties: harmful actions on the organisms

Properties of the substances: sign « F » (i.e.: F1 sensible to air and moisture)
Means of expression to be held for the use/storage: sign « S » (i.e.: S1 keep it locked up)
Risk and toxicity: sign « R » ex: (i.e.: R1 Explosive in dry state).

Always remember

- kills
- poisons
- corrodes
- irritates
- burns
- oxidizes
- explodes
- is an environmental danger
- is a biological hazard

2.2. Prevention: to read the label and instructions to protect yourself

- Know, consult and observe the rules of the labelling to identify the dangers of the chemicals: symbols of danger, sentences F, R and S (Note1).
- Read the cards of safety of the chemicals
- Do not mix anything without knowing the consequences!
- Choose the least dangerous products as far as possible.
- Comply with the rules of the product storage.
- Stockez les produits sensibles dans les armoires adéquates
- Store the sensitive products in the adequate cupboards.
- The handling of each product requires a suitable protection:
  1. Air filtering device (protecting hood).
2. Individual protection (glasses, gloves, lab coat).

**Note.1**

To obtain more precise information on the toxicity class of considered product for an experiment, please check with the literature of the product before using it on the following sites:

http://www.merck.ch  
http://www.sigmaaldrich.com  
http://www.cusstr.ch/produits

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**3.- HANDLING OF THE CHEMICAL AND BIOLOGICAL PRODUCTS AND MANAGEMENT OF THE WASTE**

Chemical and biological waste is subjected to a procedure of elimination and transportation that has been defined by the Schedule on the movements of waste (OMoD, ADR)). 814.610 of June 22, 2005 (applied in cantons on August 30, 2005).

http://www.admin.ch/ch/f/rs/814_610/index.html#fn1 (in French)

**Art. 2 List of waste**

1. The federal Department of the environment, transport, the energy and of communication (DETEC) enacts a law understanding a list of waste. It takes into account the list drawn up by the European Community.

2. It denotes the list of waste as:

- **special waste**: due to their composition or their physico-chemical or biological properties this waste require a set of techniques and particular organizational measures to be eliminated in a respectful way for the environment, even if the event of movements is inside Switzerland

- **other waste subjected to the control**: due to their composition or their physico-chemical or biological properties this waste require a **restricted** set of techniques and particular organizational measures to be eliminated in a respectful way for the environment, even in the event of movements is inside Switzerland

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**ACIDS AND BASES**

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The contact with concentrated acids and bases can cause serious burns to the skin, mucous membranes and eyes.

Handling of acids and bases should be carried out with adequate gloves and safety goggles. The wearing of contact lenses does not represent a sufficient protection against drop projections of acid or bases. You should work under hood with the concentrated acids.

Never put water in the acid or the base.

In the case of eye/skin contact with acids/bases, rinse it immediately and abundantly with water.

STORAGE OF ACIDS AND BASES

• The acids and bases must be stored separately.
• Among the acids, isolate nitric acid and perchloric acid from the others.
• One will take additional care to store the oxidizing acids separately, like HNO₃, which can react violently with the flammable organic substances.

The storage cupboards for acids and bases must be ventilated and provided with withholding storage bins.

ACID AND BASE DISPOSAL

Aqueous waste composed of concentrated mineral acid (pH=1) (nonchromic acid waste)
⇒ Bin : « DECHETS ACIDE pH=1»

Aqueous waste whose pH lies between 2 and 14 (nonchromic alkaline waste)
⇒ Bin : « ALCALIN WASTE pH=2-14»

**Destruction of the mineral acids:** HCl, HBr, HI, HNO₃, HClO₄, H₂SO₄

Progressive neutralization by a diluted mineral base: NaHCO₃, Na₂CO₃, NaOH ou KOH
Verify that the pH is close to 7.
Pour it out in the sink under running water

**Destruction of the mineral bases:** NH₄OH, NaOH, KOH, Ca(OH)₂

Progressive neutralization by a diluted mineral acid HCL ou H₂SO₄
With Ca(OH)₂ use only HCl because the calcium sulphate is insoluble.
Verify that the pH is close to 7.
Pour it out in the sink under running water.
SOLVENTS

With an exception of some halogenous derivatives, all the solvents are flammable.

**No solvent must be stored in a refrigerator, or a freezer. The solvents whose flash point is lower than the temperature of the refrigerator are likely to cause an explosion!!!**

The solvents can penetrate in the body by 3 ways:
- respiratory tract (due to their volatility),
- cutaneous way (whatever the state of the skin),
- digestive tract (accidental ingestion).

**Handling of solvents**

- Avoid the contact with the skin: use gloves and lab coat.
- Not to transfer a solvent in a bottle having contained another chemicals.
- Work far from a source of heat.
- Use systems of mechanical aspiration and glass pipettes.
- Avoid any discharge towards the sewer.
- Limit the losses due to the evaporation (open bottles etc.).
- Preserve waste in containers especially envisaged for this purpose.

**STORAGE IN THE LABORATORY**

The maximum quantity of easily flammable liquids allowed at the place of work is of 15 L (maximum capacity of the containers 3 L). They must be stored in storage bins in ventilated cupboards. The acetic acid is regarded as flammable for the storage.

**WASTE SOLVENTS**
Used halogenous and non-halogenous solvents must be stored in separate cans.
Do not pour the acid into the organic solvent waste. Explosion!!!

HALOGENOUS SOLVENTS: are regarded as halogenous solvents if they contain more than 1% mass of halogenous substances. For example:

dichloromethane
1,1-dichloroethane
chloroform (without phenol) ⇒ Bin : « HALOGENOUS SOLVENTS WASTE »
trichlorethylène
tetrachlorethylene

SOLVANT NON-HALOGENES : Exemples

Ethanol
Methanol
Tetrahydrofurane ⇒ Bin : « NON HALOGENOUS SOLVENTS WASTE »
Benzene
Acetonitrile

In the case of break out or of accidental discharge of the products, immediately cover them with absorbing inert material (sand, soil...), which must be in attendance, recover the products. If discharge occurs, evacuate area immediately, assess risks, eliminate all ignition sources, isolate pipe work, ventilate area (explosion proof equipment if mechanical means are used) and contact emergency services. Evacuation and repairs must only be undertaken by authorized personnel.

http://www.cusstr.ch/repository/58.pdf

PHENOL

Soluble in water, very reactive, strong smelling, corrosive, strongly toxic and flammable. It requires many precautions for handling and storage.

Store phenol at fresh and ventilated spaces, protected from the sunlight, any source of ignition or heat and apart from the oxidizing products.

Handling
• To avoid any contact with the skin and eyes.
• To avoid vapor inhalation.
• Cause burns.

In the case of skin contact, rinse it immediately with a large amount of water during 15 minutes.

In the case of surface contamination, immediately sponge it by absorbing material. Rinse the contaminated surface with a large amount of water.

If the contamination is significant, evacuation and repairs must only be undertaken by authorized personnel.

**PHENOL WASTE**

The chemicals and their residues must be regarded as special waste
Phenol, Phenol/Chloroforme => Bin : « PHENOL/PHENOL-CHCl₃ » (Solution)


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**2-MERCAPTOETHANOL (β-MERCAPTOETHANOL)**

- The substance is irritating to the eyes, skin and the respiratory tracts.
- The substance has little effect on the central nervous system.
- Do not to throw the residues in the sewer.

Store 2-MERCAPTOETHANOL at fresh and ventilated spaces, protected from the sunlight, any source of ignition. Keep separated from oxidants, metals.

**Handling**

- after contact with the skin: rinse immediately with water.
- after contact with the eyes: rinse them abundantly with water and keep eyelids open for several minutes.
2-MERCAPTOETHANOL WASTE

The chemicals and their residues must be regarded as special waste.

2-Mercaptoethanol ⇒ Bin: « 2-MERCAPTOETHANOL »

In the case of surface contamination, immediately sponge it by absorbing material. Rinse the contaminated surface with a large amount of water.

If the contamination is significant, evacuate the personnel only with trained operators equipped with protective gears

http://www.promega.com/msds/France/frenchmsds/Z523(F).pdf

FORMALDEHYDE

- Avoid vapor inhalation: work under hood.
- Avoid contact with the skin: use gloves and lab coat.
- Work far from any source of heat.
- Use systems of mechanical aspiration and glass pipettes.
- Avoid any discharge towards the sewer.
- Preserve waste in containers especially envisaged for this purpose.

Handling

How to eliminate formaldehyde solutions?

a- In the case of accidental spill

Turn off all possible sources of ignition in the laboratory. Wear appropriate personal protective equipment (glasses, lab coat and butyl or nitrile rubber gloves). If the still is important, use a suitable respiratory protection. Disperse absorbent over liquid (better a 1:1 mixture by mass of sodium or calcium carbonate and absorbent. Discard the liquid mixture in a container and disposed it as hazardous waste.
If the spill is small, place the container in a fume hood. Add cold water (approximately 10 mL per 1 mL solution of formaldehyde), then slowly add a solution of commercial bleach (25 mL of bleach to 1 mL solution of formaldehyde). Leave for 20 minutes at room temperature. Let the heterogeneous mixture to settle and recover the liquid. The residue is considered has a strong normal waste. After neutralization the liquid may be poured at the sewer

b- Handling of wastes

For large quantities of solutions, disposal must be proceeded by an approved company. Place the solutions in containers properly labeled.

For small amounts of waste. Wear butyl or nitrile rubber gloves, lab coat and glasses. Under the hood, slowly add the diluted formaldehyde solution (approximately 10 mL of water to 1 mL of formaldehyde) to an excess of commercial bleach (25 ml of bleach to 1 ml formaldehyde). Stir for 20 minutes, then discard the solution in the sewerk after neutralization (pH 5.5 to 8.5).

CRYOGENIQUES

Les gaz qui ne peuvent être liquéfiés à température ambiante par seule augmentation de la pression sont appelés cryogéniques. A l’état liquides, ou solides, comme dans le cas de la carboglace, les cryogéniques sont utilisés comme produits de réfrigérations.

LIQUID NITROGEN

Liquid nitrogen has a temperature of -196°C and causes burns by freezing, which can be extremely serious particularly if the nitrogen reaches the cornea.

There is also risk of asphyxiation in the case of massive release. This is why it is recommended to store liquid nitrogen in a sufficiently ventilated room.

The wearing of protective gloves against the cold (blue gloves) and of goggles is obligatory
The prevention rests on:
  • Forbidden discarding of nitrogen in any place where its accumulation could be dangerous (sewers, basements, pits, closed room)
  • No white frost on the safety valve,
  • Act slowly when you plunge an element in the bath of liquid nitrogen
  • Never place nitrogen in closed containers, or in a Thermos bottle: instead use special broad opening containers.

BURNS FROM LIQUID NITROGEN

*ATTENTION! The temperature of the lesion must be made to body temperature as soon as possible.

*Rinse the burn with lukewarm water for at least 15 minutes; cover it with a sterile bandage; consult a doctor.


OTHER WASTE

Waste containing oxidants?

MnO₄⁻, ClO₄⁻,

(Cr₂O₇)²⁻ Ce⁴⁺ ⇒ Bin: «OXYDANTS »

(CrO₄)²⁻ (S₂O₈)²⁻ etc.

Hydrogen peroxide, H₂O₂: to dilute and pour in the sink

Waste containing heavy metals?

Cu²⁺, Zn²⁺, Pb²⁺,

Sn²⁺, Al³⁺, Cd²⁺ ⇒ Bin: «HEAVY METALS»

Fe²⁺, Fe³⁺ etc

SOLID CHEMICAL WASTE:

It is forbidden to throw potentially dangerous chemicals in household garbage.

  • The products that are still labelled will be left in their original package.
• The products that are not able to be identified will be left in their package indicating «UNKNOWN PRODUCT»

3. RADIOACTIVE SUBSTANCES HANDLING

The laboratory of the DBMV is a laboratory of the type C (LAB C) room 5404.1

Activity limits (AL)
Activity limits, specific to each nuclide, are certified for the various laboratories and defined by the regulation of the protection against radiation. Generally, the authorized limits for the various laboratories are multiples of the limits authorized in standard laboratory.

Standard Lab : < AL (does not necessitate the authorization)
Lab C : < 100 AL
Lab B : < 10000 AL
Lab A : according to the authorization

Permissible amounts:
In Switzerland, the tolerated limits of annual amount of the exposure of the workers is 20mSv. However, certain exposures are subjected to the different limits:

• The limiting amount is extended to 500 mSv when the exposure relates only to the skin, feet or hands.
• The equivalent amount of an external irradiation should not exceed 2 mSv on the exposed surface of the abdomen of the expecting mothers
• The effective amount of incorporated radioactivity should not exceed 1 mSv of the expecting mothers who are exposed within the framework of their profession.

For more information on protection of the expecting mothers consult: http://www.chuv.ch/ira/

The women who breastfeed are not allowed working with radioactive substances, because of harmful radioactive incorporation and contamination.

Obligation of announcement: Any person intending to handle radioactive substances must announce oneself before to an expert of protection against radiation:

Responsible for radioprotection Biophore: Blaise.Pavillard@unil.ch

Safety regulation for Lab C.

The following rules must be strictly respected during the handling of radionuclides
• The access to the laboratory C is forbidden to non-authorized people
• Wearing of the badge, the lab coat and the gloves is obligatory during work with the radionuclides.
• The direct contact between hands and containers containing radioactive substances must be minimized
The ring of control goes under the glove of the hand which generally holds the sample, sensitive face against the palm.

The dosimeter badge goes on the lab coat to height of the chest sensitive face towards outside.

It is forbidden to drink, eat, smoke and use cosmetics in the laboratory.

In general, it is not advised to station there unnecessarily.

All manipulations presenting a risk of contamination are done on an absorbing paper surface.

Avoid the formation of aerosol and the dispersion of droplets caused by use of syringe (filtering etc...)

Avoid working in the presence of the stock of radioactive substance; store it as soon as the removal is carried out.

Use of screens and the distance correctly.

Verify frequently radioactive contamination of surface. Localize area of spill. Place absorbent material over a liquid spill.

Do not track contamination out of the spill area, if possible. Remove shoes at the edge of contaminated area.

It is imperative to control the radioactivity levels before leaving the laboratory.

In the case of an accident or contamination, contact the Radiation Safety Officer who will take part in the operations of decontamination. If people were contaminated, he will warn the:

Institut de radiophysique appliquée (IRA)
Grand-Pré 1
1007 Lausanne
Tél (021) 623 34 34
http://www.chuv.ch/ira/

At the end of each handling, the objects must be controlled and if necessary decontaminated or announced.

The contamination of any outgoing object of the laboratory must be controlled. The contaminated objects must stay.

Verify the contamination of the hands and the working clothes before leaving the laboratory.

Carefully wash the hands at the end of each handling and before leaving the room.

To register purchases, use and scrap radioactive substances in the inspection specification.

Write the purchases of radioactive substances, utilization and radioactive waste in the control booklet.

The containers containing radioactive substances must carry the symbol of danger ionizing radiations, the indication of the nuclide, activity, date and the user name.

Radioactive liquid must not be thrown in the sinks, except water used for washing steps.

Some common radioisotopes

<table>
<thead>
<tr>
<th>Radioisotope</th>
<th>Limit of exemption</th>
<th>Authorized limit in standard laboratory</th>
<th>Lab C limit</th>
<th>Contamination limit of the surface</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tritium</td>
<td>6*10^7 Bq</td>
<td>3*10^8 Bq</td>
<td>3*10^9 Bq</td>
<td>1000 Bq/cm^2</td>
</tr>
<tr>
<td>Carbone-14</td>
<td>2*10^7 Bq</td>
<td>9*10^8 Bq</td>
<td>9*10^9 Bq</td>
<td>30 Bq/cm^2</td>
</tr>
<tr>
<td>Phosphorus-32</td>
<td>4*10^7 Bq</td>
<td>1*10^9 Bq</td>
<td>1*10^9 Bq</td>
<td>3 Bq/cm^2</td>
</tr>
<tr>
<td>Sulfure-35</td>
<td>4*10^7 Bq</td>
<td>7*10^9 Bq</td>
<td>7*10^9 Bq</td>
<td>30 Bq/cm^2</td>
</tr>
<tr>
<td>Calcium-45</td>
<td>1*10^7</td>
<td>7*10^9 Bq</td>
<td>7*10^9 Bq</td>
<td>10 Bq/cm^2</td>
</tr>
</tbody>
</table>
At the lowest measurement of a certain activity, called limit of exemption and defined by the regulation on protection against radiation, a radionuclide is not regarded as radioactive.

**ORDERING / ELIMINATION**

Toute acquisition, utilisation et élimination de substance radioactive doit être enregistrée, selon les consignes de l’expert en radioprotection.

**STORAGE**

The radioactive substances are separately stored from other substances. The radioactive products are separated between them by taking in account their chemical incompatibilities.

**RADIOACTIVE WASTE.**

The radioactive waste or contaminations should not be eliminated before it has been controlled. The radioactive waste or contaminations should be handled by the authorized personnel only.

The radioactive waste will be put separately in marked containers « RADIOACTIVE WASTE » indicating: the isotope, the estimated activity in MBq, the date of the experiment, the name of the user and number of the laboratory.

Solid waste \(\Rightarrow\) «DECHETS RADIOACTIFS SOLIDES»

Liquid waste (polyethylene bin) \(\Rightarrow\) « LIQUID RADIOACTIVE WASTE »

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**4. GENOTOXIC PRODUCTS**

*Cancérogènes et mutagènes.*

Attention, il s'agit des produits étiquetés «Toxiques» comportant en plus les phrases suivantes sur l’étiquette:

- **R45:** May cause cancer
- **R46:** May cause heritable genetic damage
- **R49:** May cause cancer by inhalation
- **R60:** May impair fertility
- **R61:** May cause harm to the unborn child.
Expecting mothers must not handle the products marked as follows

- **R46**: May cause heritable genetic damage
- **R60**: May impair fertility
- **R61**: May cause harm to the unborn child

Very carcinogenic products: Ethidium Bromide
Acrylamide/Bis-acrylamide!

All the containers containing genotoxic products (pure or in solution) must carry a clear and undeletable mark «GENOTOXIC DANGER »

Handling of genotoxic products is carried out with double pairs of gloves, safety goggles and hood.

For the very volatile liquids a mask with cartridge is essential

WEIGHING.

If possible, use a balance that is intended to be used for the genotoxic products, exclusively. To use the system of double-weighing: in a previously weighed bottle, place a quantity of product and carry out the weighing. Add the quantity of solvent necessary to obtain the desired concentration. Close the bottle again.

DECONTAMINATION OF THE MATERIAL.

The person must decontaminate dishes before placing them in standard washing route. This decontamination depends on the used product. The use of disposable dishes is preferable.
STORAGE OF WASTE.

For the pure products or concentrated solutions: preserve the containers of origin and do not empty them. These containers must be placed in a double sealed unbreakable packing and immobilized by an absorbent.

One must not throw even diluted solutions of the genotoxic products to the sink: recover them in containers ⇒ «DANGER GENOTOXIC WASTE (LIQUIDS)»

Solid waste has to be eliminated by packing in a resistant plastic and placing in the container ⇒ «DANGER GENOTOXIC WASTE (LIQUIDS (SOLID))», as well as the already used pipette tips.

ETHIDIUM BROMIDE: EtBr

R 23-68
S 36/37-45

Ethidium bromide (C$_{21}$H$_{20}$BrN$_{3}$, CAS-N°: 1239-45-8) is a powerful mutagen that must be handled with precaution (too much risk concerned). **One should wear two pairs of gloves.**

Liquid wastw elimination EtBr : Adsorption on activated carbon (Appendix 1)

Treat the solution of EB by activated carbon, effective minimal quantity: 1000 mg of activated carbon per mg of EtBr.

After checking of the effectiveness of the treatment (UV, colourless solution), decant the treated solution in the sink under running tap water.

Solid waste containing of the EtBr (contaminated activated carbon) must be stored in suitable containers: ⇒ «ETHIDIUM BROMIDE».

Depose the gel (packed in a resistant plastic) and gloves in the same container.

Replacing product:

*GelRed*™

**SYBR Safe™ DNA Gel Stain**
The safer ethidium bromide alternative

**ACRYLAMIDE/BIS-ACRYLAMIDE**

*Toxic*  
*S 53-26-36/37-45*

Acrylamide monomer (C₃H₅NO) is neurotoxic by the contact. Pipette it with a bulb or automatic dispenser, work under hood and wear gloves.

**WASTE**

Preserve waste in the containers envisaged for this purpose ⇒ «DANGER GENOTOXIC WASTE »

Depose the gel (packed in a resistant plastic) and gloves in the same container.

In the case of surface contamination, immediately sponge it by absorbing material. Rinse the contaminated surface with a large amount of water.

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**5. BIOSECURITY**

The majority of the micro-organisms used at the DBMV are arranged in group 1. (Groups of risk of the micro-organisms and the classes of activity, see Appendix 2)

- The handling of the genetically modified micro-organisms and experiments of genetic transformation must be only carried out under the laminar flow equipment.
- Before and after use, the hoods must be cleaned with disinfectant.

To avoid any risk of dissemination of genetically modified material (DNA, micro-organisms, or transformed plant material), the tubes, the pipettes, Petri dishes and tissue paper, which are contaminated with the genetically modified material, have to be inactivated before elimination; the same is true for the plant material and the bacterial cultures.

**BIOLOGIC WASTE**
**Liquid biologic waste** is treated by 1% sodium hypochlorite (bleach) (or by others disinfectants whose effectiveness is known) or by autoclaving before being eliminated in the sink. Liquid biologic waste must not contain chemical or radioactive liquid waste which must be eliminated like special waste as it has been aforementioned.

**Solid biologic waste**, : the sharp or cutting objects, which were used for the culture or handling of biological material are collected in bags or special containers with the initials “bio-hazard” before being autoclaved.

**Decontamination with ethanol**, , use an aqueous solution with 70% ethanol to decontaminate working surfaces, pots and centrifuge rotors.

**Do not autoclave the material that has been treated with the sodium hypochlorite. Vapours of chlorine are dangerous for the users and corrosive for the autoclave.**

Each group assigns a person in charge of the autoclave of biological waste.

For informations find more at:

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**6. VEGETAL MATERIAL: SOIL AND PLANTS**

Sterilization of the vegetal waste: put the soil and plant waste in the yellow bags: «Bio HAZARD BAG »

**Responsable**
M. Blaise Tissot
TEL N° 42 4201* - 4239

**ANIMAL WASTE**: see with Blaise Pavillard
Phone : 021 692 41 83/ 41 60/ 42 60
Office : 3124
Blaise.Pavillard@unil.ch

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**7. WASTE OF THE PHOTOGRAPHIC DEVELOPERS (DBMV)**

Baths containing the developer with solvant ⇒ Bin : « DEVELOPER»

Baths of bleaching/fixations ⇒ Bidon : « BLEACHING/FIXATIONS »
8. ELIMINATION OF THE EMPTY BOTTLES HAVING CONTAINED CHEMICALS

Rinse the emptied container under running water. Throw the lid and cross out label by a black marker.

9. SHARP OBJECTS

Razor blades, needles, etc. ⇒ Special Bin : « DECONTAMINATED SHARP OBJECTS » ⇒ DUSTBIN

RESPECT THE USE OF THE DUSTBINS AND THE WASTE MANAGEMENT.

WASTE, PRODUCT, MATERIAL OR PAPERBOARD WILL NOT BE LEFT AT ANY PLACE, IN THE INTERIOR OR OUTSIDE OF THE BUILDING.

PILES, PAPER, PAPERBOARD, GLASS, SAGEX, LASER CARTRIDGES, CAPSULE NESPRESO, GAS BOTTLES, ALUMINUM, GLASS AND TINPLATE HAVE TO BE BROUGHT TO: RECYCLING ROOM BIOPHORE 1930

Additional informations:

www.cheminfo.ch
www.chemsuisse.ch/

Commission Universitaire pour la Santé et la Sécurité au Travail Romande
http://www.cusstr.ch/index.php

Office fédéral de l'environnement OFEV

SECURITE UNIL
http://www.unil.ch/fbm/page2293_fr.html

Toxicologie Recherche d'informations sur les produits chimiques
http://www.aimt67.org/toxicologie.htm

Fiche de Données de Sécurité VWR

Fiches Toxicologiques INRS
http://www.inrs.fr/
Guide Gestion Déchets EPFL

(A votre disposition Bureau 5442, A. Fariña)
EMERGENCY PROCEDURE

The emergency phone number for any incident occurring on the UNIL site is 115.

The emergency number is active 24 hours/day and 7 day/week and should be called in the event of any kind of emergency.

1. Call 115
2. Give your name and surname
3. Describe the situation
4. Give the exact location and the time of the event
5. Give the number of wounded if appropriate

How to behave in case of fire or explosion

<table>
<thead>
<tr>
<th>Action</th>
<th>Icon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alarm (fire button)</td>
<td></td>
</tr>
<tr>
<td>Call 115 or 0118 (Fire brigade)</td>
<td></td>
</tr>
<tr>
<td>Save and rescue persons in danger</td>
<td></td>
</tr>
<tr>
<td>Close doors and windows</td>
<td></td>
</tr>
<tr>
<td>Turn off the gas and remove flammable liquids from the danger zone</td>
<td></td>
</tr>
<tr>
<td>Stop and secure your lab experiments if possible</td>
<td></td>
</tr>
<tr>
<td>Use the extinguisher or extinguishing system</td>
<td></td>
</tr>
<tr>
<td>Inform fire brigade (person to rescue, specifics hazards)</td>
<td></td>
</tr>
</tbody>
</table>
How to behave in case of building evacuation (intermitting horn)

<table>
<thead>
<tr>
<th>Instruction</th>
<th>Image</th>
</tr>
</thead>
<tbody>
<tr>
<td>Take with you all your belongings (keys, coat,…) as you will not be able to reenter the building immediately</td>
<td></td>
</tr>
<tr>
<td>Follows the exits signs</td>
<td>![Exit Sign]</td>
</tr>
<tr>
<td>Use the stairways only</td>
<td>![Stairway Sign]</td>
</tr>
<tr>
<td>Follow the indications given by the intervention services, they will act as guides to indicate the meeting place</td>
<td>![Guidance Sign]</td>
</tr>
<tr>
<td>Do not run, stay calm</td>
<td></td>
</tr>
</tbody>
</table>

**Signs**

- Emergency showers
- First aid location
- Eye wash
- Emergency Exit
- Meeting place
MEETING POINTS

When fire alarm sounds, calmly evacuate the building. Use the staircases only. Do not panic, follow the emergency exit signs.

DON'T USE LIFTS.

Everyone should proceed to a designated meeting point where headcounts can be taken. Evacuation will be supervised by members of the fire brigade.
Annexe 1

Extractor® EtBr system
Ethidium Bromide (EtBr) Waste Reduction System

The Extractor system is a one-step filtration funnel device for the rapid removal of ethidium bromide from gel-staining solutions. This disposable unit contains an activated carbon matrix, which removes >99% of ethidium bromide from electrophoretic buffer quickly and easily. Each device can decontaminate up to 10 litres of gel staining solution. After filtration, the decontaminated solution can be safely poured down the laboratory drain.

The Extractor funnel device fits most standard laboratory flasks and bottles (neck size 33-45mm), and the unit includes a cap for storage between uses. The polypropylene housing is chemically resistant to organics. Also included in the package are glass fibre prefilters, which remove gel pieces and other debris to avoid premature clogging of the carbon filter.

Ordering Information - Extractor® Ethidium Bromide (EtBr ) Waste Reduction System

<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity/Pack</th>
<th>Catalogue Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extractor - Starter Pack</td>
<td>2</td>
<td>10 448 030</td>
</tr>
<tr>
<td>Extractor - Standard Pack</td>
<td>6</td>
<td>10 448 031</td>
</tr>
</tbody>
</table>

http://www.whatman.com
### Clôture des risques des microorganismes

#### Classe de danger

<table>
<thead>
<tr>
<th>Niveau de danger</th>
<th>Définition (suite)</th>
<th>Propagation</th>
<th>Exemples de souches</th>
<th>Exemples de traitements</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Faible</td>
<td>Pas susceptible de provoquer une maladie chez l'homme amin</td>
<td>En cherichia coli K12, Pseudomonas fluorescens, Bacillus subtilis</td>
<td>Aspergillus niger, Penicillium camembertii, S. cerovina</td>
</tr>
<tr>
<td>2</td>
<td>Moyen</td>
<td>Peut provoquer une maladie chez l'homme. Propagation imprévisible dans la collectivité</td>
<td>En cherichia coli (ga plumpa), Pseudomonas aeruginosa, Seramia marcescens</td>
<td>Aspergillus flavus, Candida albicans, Microsporum canis, Trichophyton rubrum</td>
</tr>
<tr>
<td>3</td>
<td>Élevé</td>
<td>Il existe généralement une prophylaxie ou un traitement efficaces</td>
<td>En cherichia coli, Bacillus anthracis, Yersinia pestis, Pseudomonas malti, Mycobacterium tuberculosis</td>
<td>E. coli O157:117, Coccidoides immitis, Z. monacosa dermatis</td>
</tr>
<tr>
<td>4</td>
<td>Très élevé</td>
<td>Il n'existe généralement pas de prophylaxie ni de traitement efficace</td>
<td>En cherichia coli, Bacillus anthracis, Yersinia pestis, Pseudomonas malti, Mycobacterium tuberculosis</td>
<td>En cherichia coli, Bacillus anthracis, Yersinia pestis, Pseudomonas malti, Mycobacterium tuberculosis</td>
</tr>
</tbody>
</table>