# COSEC training -

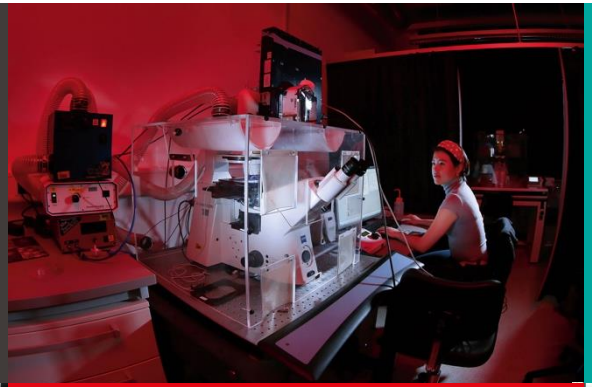
## workshop : storage of chemicals and inventory of chemicals

OHS

Occupational Health and Safety

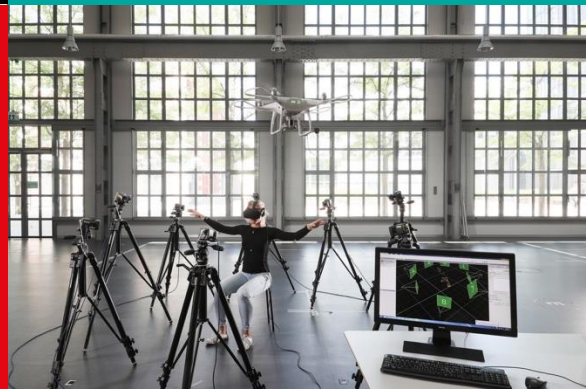
# How to find the correct storage place of a chemical

Find the right place



Use the flow chart and control the SDS and respect both documents

Respect table of incompatibilities



# Safe storage of chemicals by separating them in different categories

Acute toxicity (fatal or toxic)

Oxidisers

Aquatic toxicity

Skin corrosion
Burns
Eye damage
Corrosive to metal

Explosives
Self-reactive
Organic peroxide

Compressed gas
Liquefied gas
Dissolved gas
Refrigerated liquefied gas

Flammable
Pyrophoric
Self-heating
Emits flammable gas
in contact with water
Self-reactive
Organic peroxides

Carcinogenicity
Mutagenicity
Reproductive toxicity
Respiratory sensitizer
Target organ toxicity
Aspiration toxicity

Irritant (skin and eye)
Skin sensitizer
Acute toxicity (harmful)
Narcotic effects
Respiratory tract infection
Hazardous to ozone layer

*At EPFL, the chemical storage system is based on the GHS pictograms and compatibilities of different chemicals.*

Whenever you work with chemicals bearing a GHS pictogram:

- Wear protective gloves.
- Adapt glove material to the chemical (refer to SDS chapter 8 and online training FOBS1+2).
- Always remove gloves when leaving the laboratory and before touching "shared" objects (door handles, telephone, keyboard, etc.).

# Storage places for chemicals in your lab

Chemical hood only for **waste storage**

Fridge EX (explosion-proofed)


EI 90 cupboard


Fridge

Shelf

EI 30 connected to the ventilation

# Safe storage of chemicals

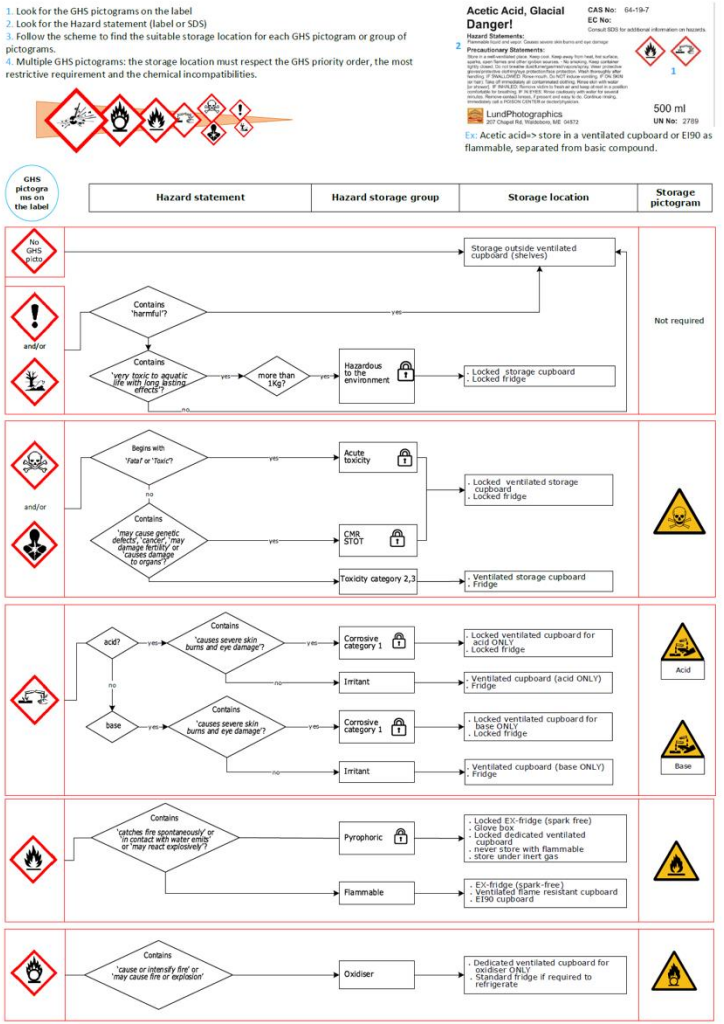


1. Find the appropriate storage place:

➢ Chemical storage workflow

2. Respect the incompatibilities:

➢ SDS chapters 7 & 10



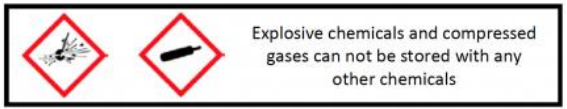
# Step 2 : Incompatibility chart



| | Oxidizing | Flammable | Corrosive: ACID | Corrosive: BASE | Health hazard / toxic |
|---|---|---|---|---|---|
| Oxidizing | | | | | |
| Flammable | | | | | |
| Corrosive: ACID | | | | | |
| Corrosive: BASE | | | | | |
| Health hazard / toxic | | | | | |

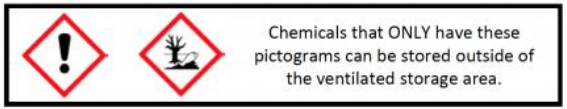
LEGEND

| Not Compatible | Store according to SDS Section 7 and 10 | Compatible |
|---|---|---|



Explosive chemicals and compressed gases can not be stored with any other chemicals

Separate liquids and solids



Chemicals that ONLY have these pictograms can be stored outside of the ventilated storage area.

In case of multiple hazard pictograms the following order should be considered

Note that two chemicals can have the same pictogram and still be incompatible!

**Example: Acetic acid and triethylamine are both flammable, but cannot be stored together because they are an acid and a base.**

# STEP 2 : Separate

In the lab

- Explosive → Inform OHS
- Solid
  - Flammable
  - All the rest
- Liquid
  - Oxidizer
  - Flammable
  - Water reactive Pyrophoric
  - Corrosive-acid
  - Corrosive-base
  - Toxic
  - Irritating Environment
- Gas → Refer to the online gas training

*The more chemical hazards you have, the more storage places you need in your laboratory.*

*Each colored box corresponds to a separate cupboard !*

# Storage criteria for solid chemicals

**Solid**

Flammable (pyrophoric, water reactive, self heating compounds)

*Store apart in a ventilated cupboard, EI90, desiccator, certified EX fridge or glove box according to the intrinsic reactivity of the compound.*

*Store in a ventilated cupboard.*

*If in fine powder form, check SDS for incompatibilities and store isolated in a secondary container.*

*Store solids, that can sublime at room temperature, isolated from other chemicals in the fridge.*

*Store in a cupboard or on the shelves.*

# Storage criteria for liquid chemicals

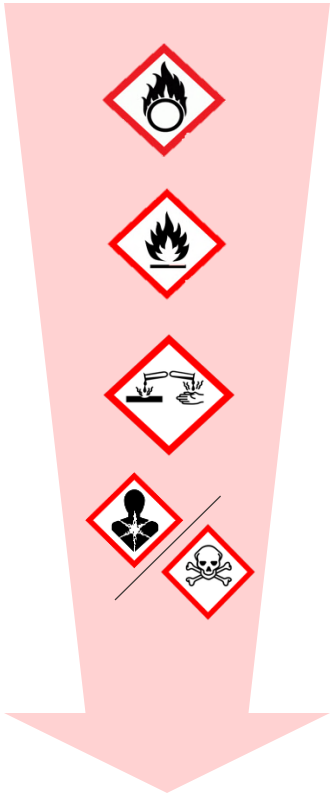
**Liquid**

| | |
|---|---|
| Oxidizer  | *Ventilated cupboard, EI 90* |
| Flammable  | *Ventilated cupboard, EI90, desiccator, certified EX fridge.* |
| Water reactive pyrophoric  | *Ventilated cupboard, EI90, desiccator, certified EX fridge or glove box according to the intrinsic reactivity of the compound.* |
| Corrosive-acid  | *Ventilated locked* cupboard specific for corrosive. Acid and base are stored into two separated cupboards.* |
| Corrosive-base  | |
| Toxic  | *Ventilated locked* cupboard* |
| Irritating /environment  | *Cupboard or on the shelves* |

**All liquids are stored in a retention tray**

**For GHS cat. 1 (check SDS)*

# Multiple GHS pictograms



| | Oxidizing | Flammable | Corrosive: ACID | Corrosive: BASE | Health hazard / toxic |
|---|---|---|---|---|---|
| Oxidizing | | | | | |
| Flammable | | | | | |
| Corrosive: ACID | | | | | |
| Corrosive: BASE | | | | | |
| Health hazard / toxic | | | | | |

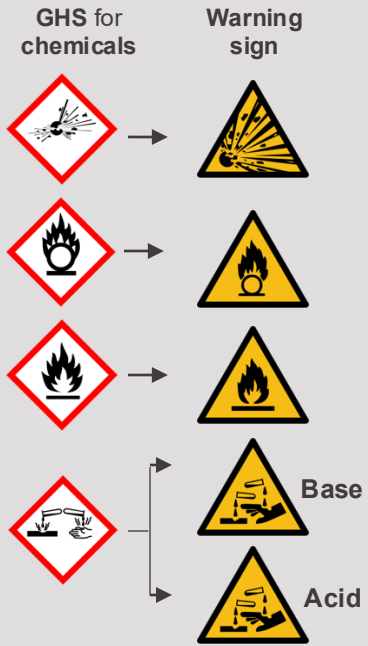
Not compatible  Check the SDS  Compatible

In case your chemical has more than one GHS pictogram : Choose the storage place for your chemical with the pictogram with the highest priority according to this list.

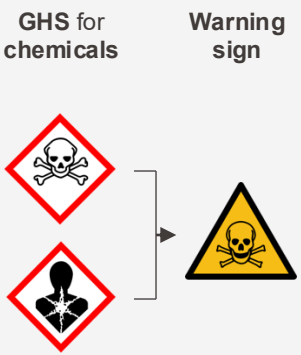
# Display the corresponding warning signs

## Physical hazards

*(priority from top to bottom; only 2 different pictograms on one cupboard)*



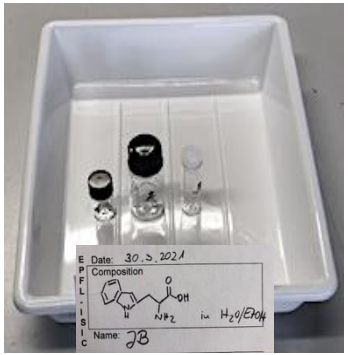

## Health hazards




# Label your personal samples/solutions

| Date: | |
|---|---|
| Molecule name or Lab notebook ref.:<br><br>Solvent:<br>Concentration: | Hazard pictograms |
| Name: contact person | |

| Date: 01.2020 | |
|---|---|
| Molecule name or Lab notebook ref.:<br>LNB06 page 9<br><br>Solvent: MeOH<br>Concentration: 20% |  |
| Name: C. Truc | |




**The label must indicate :**

- What you have inside (**molecule name**, concentration or lab notebook ref).
- **Solvent** (abbreviations accepted)
- The **date**
- The **GHS pictograms** (of the solvent)
- The **person who is responsible** (abbreviation accepted)

Templates available at the chemical shops

# Chemical waste storage


**Storage of chemical waste =**
**same rules apply as for chemical storage**

- Incompatible waste containers are separated.
- Food packaging and glass containers are prohibited.
- Liquid waste is stored in retention trays.
- Containers are properly labelled.
- Use appropriate and approved waste containers with the safety cap.
- Do not store waste longer than 2 months.
- Dispose when waste reaches 80% of the container volume.

Use this safety cap with a white pressure valve

# Tracing chemicals

OHS

Occupational Health and Safety

# Chemical product inventory

- Legal basis:
  - OLT3, sec.3a art.24: “The employer keeps an inventory of the substances and preparations used in his company in accordance with the law of 15 December 2000 on chemical products and carries out an assessment of the hazards and risks associated with the activities carried out with these chemical products’.”

  - EPFL : carry out 2 inventories/year using Catalyse inventory tool (JAGGAER)

# Tracing your chemicals

- An inventory required to ensure traceability of chemicals
  - An inventory audit is requested by the confederation
  - LEX 5.8.1 Directive concernant les achats à l'EPFL
  - Useful to the group for inventory tracking and product location
  - Useful for the OHS service to register hazardous products by laboratory (cadaster)
  - Useful for the intervention team SIS (115)
- Every unit must have an inventory of chemical products
  - An inventory, must be up to date
  - The location must be known at least down to cabinet level

# How does it work ?



- Step 1:
  - Create location in LHD
  - *https://lhd.epfl.ch/lhd_cosecs/barcodes/#/insert*

# Tracability of chemical products

- Support for the inventory of your chemicals :

  - Catalyse is the official, centralized tool for ordering consumables and equipment
  - Catalyse's chemical catalog (Jaggaer) features an inventory module:

    - **Operational for all faculty units**
    - Other tools, such as Excel or Slims, are provisionally accepted.

*https://lhd.epfl.ch/lhd_cosecs/barcodes/#/insert*

# Create a bar-code for storage places of the chemicals

- Mangement of the bar-codes of the storage places

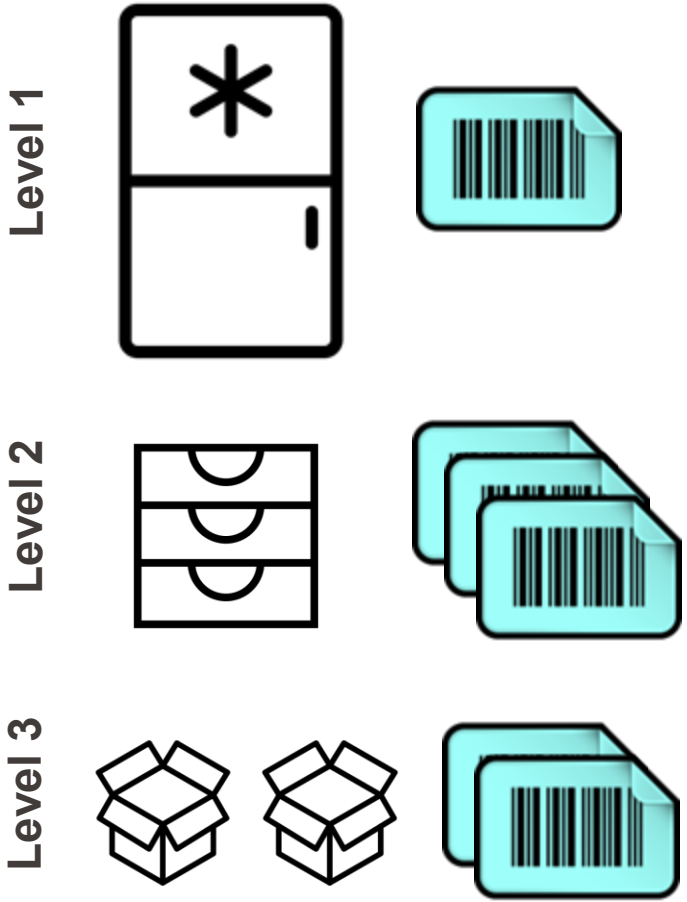
3 types available

- 1. Fridges or cupboards (**mandatory**)
- 2. Retention tray or shelve
- 3. Box of storage or section of a shelve

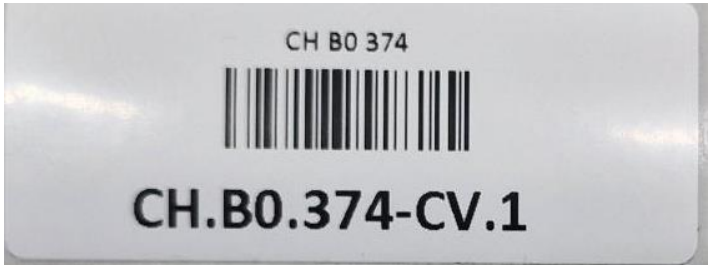
- Creation of the bar-codes in LHD (Laboratory Hazard Database)

  - Accessible for COSECs only
  - The shop prints the bar-codes for the place /lab
  - Every Tuesday you can pickup the bar-codes from the faculty shop

*https://lhd.epfl.ch/lhd_cosecs/barcodes/#/insert*



Speaker

# How does it work ?



- Step 2:
  - Get in touch with your faculty shop:
    - SB Faculty ➔ magasins CH et BCH, I17
    - SV Faculty ➔ magasin SV (ou ALP)
    - STI Faculty ➔ magasin MXE
    - ENAC Faculty ➔ magasin SV

# How does it work ?

- Step 3:
  - Taking inventory…
  - If possible, do everything at once to facilitate data reconciliation

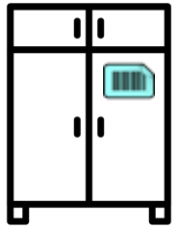
- Step 4:
  - Report illegible or non-existent barcodes:
    - CAS n°
    - Supplier
    - Name
    - Location

# How to do the inventory of chemicals ?



1. Every 6 month : Take the scanner CATALYSE from the shop and identify yourself

2. Go into your lab and scan the bar-code for the storage place



**Attention to the bar-code of the product**

3. Then scan the bar-code of every chemical

Repeat for every storage place

4. Return to the shop and validate your scans (all your products = inventory) on the CATALYSE station

5.Inspections of errors by the shop personal

**5.1** Shop indicats the products missing

**5.2**. Return the following info to the shop:

*n° CAS, Furnisher, Quantity, Storage place*

**5.3.** The shop generates a new bar-code

**5.4.** Label the product with the new bar-code

# Types of storage places for chemicals

Definition of each barcode parts :

1. AI.2127 : Room number
2. –H : Localisation
   a. « – » : located **in** the room
   b. « –H. » : located **in the hall** near the room
   c. « –T. » : located **on the terrace** near the room
3. C : Type of container
   a. « **C** » : cabinet containing **chemicals**
   b. « **G** » : cabinet containing **gases**
   c. « **R** » : refrigerator
   d. « **F** » : freezer
   e. « **GB** » : glovebox
   f. « **S** » : shelf or bookcase
4. 9V : Container subtype
   a. « **9** » : fire proof cabinet for 90 minutes
   b. « **V** » : ventilated cabinet
   c. « **EX** » : explosive protected cabinet
5. 1 : location number
6. S2 : sublocation number (here : 2nd shelf) – Max. 30
7. A : sub-sublocation number (here : 1st bac) – Max. 26

**AI.2127 –H. C 9V. 1 S2 A**
1 2 3 4 5 6 7

**Print the labels for the storage places in the shop**

https://lhd.epfl.ch/lhd_cosecs/barcodes/#/insert

*https://lhd.epfl.ch/lhd_cosecs/barcodes/#/insert*


Occupational Health and Safety

# Tracing chemicals

URGENCES 115 (021 693 3000)

**LABO BIOLOGIE**

SB - ISIC - LCBM **CH B3 474**

**Contacts**

| | | |
|---|---|---|
| Fierz, Beat | Reponsable | 37153 |
| Majerus, Enguerran | COSEC | 33132 |

**Contacts en cas d'urgence**

| | |
|---|---|
| **Hovius, Ruud** | **33134** |
| Chang, Po-Han | 38015 |

**Dangers**

**Quantité 1-5 [L, Kg]**

Acide (liquide) Base (liquide)

**Quantité 25-100 [L,Kg]**

Liquide

**Quantité 5-50 [g, mL]**

Solide

**Obligations** **Interdictions**

**Autorisation d'accès**

**Informations supplémentaires**

Enregistré le **28.10.2024** à 13h44 par Majerus, Enguerran

- Make an inventory of your chemicals twice a year (gaz included)
- Label all 'home made products, solutions, mixtures.
- Dispose of all un used products and which are older then 5 years..
- Update the door panel once a year and after every change (hazard, person etc).