



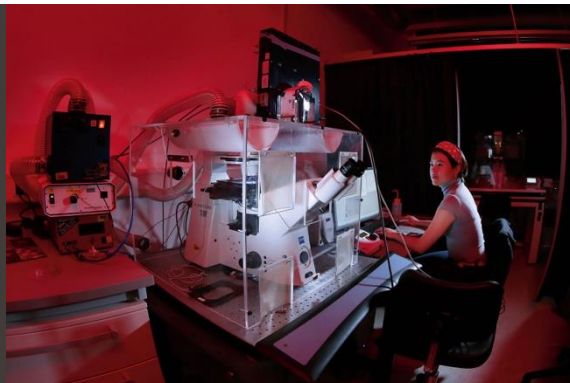
COSEC training -

workshop : storage of chemicals and inventory of chemicals

OHS

How to find the correct storage place of a chemical

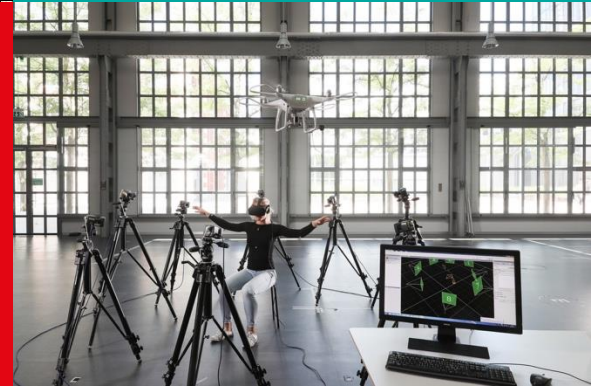
Find the right place



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. Look for the GHS pictograms on the label
2. Look for the Hazard statement (label or SDS)
3. Follow the scheme to find the suitable storage location for each GHS pictogram or group of pictograms.
4. Multiple GHS pictograms: the storage location must respect the GHS priority order, the most restrictive requirement and the chemical incompatibilities.



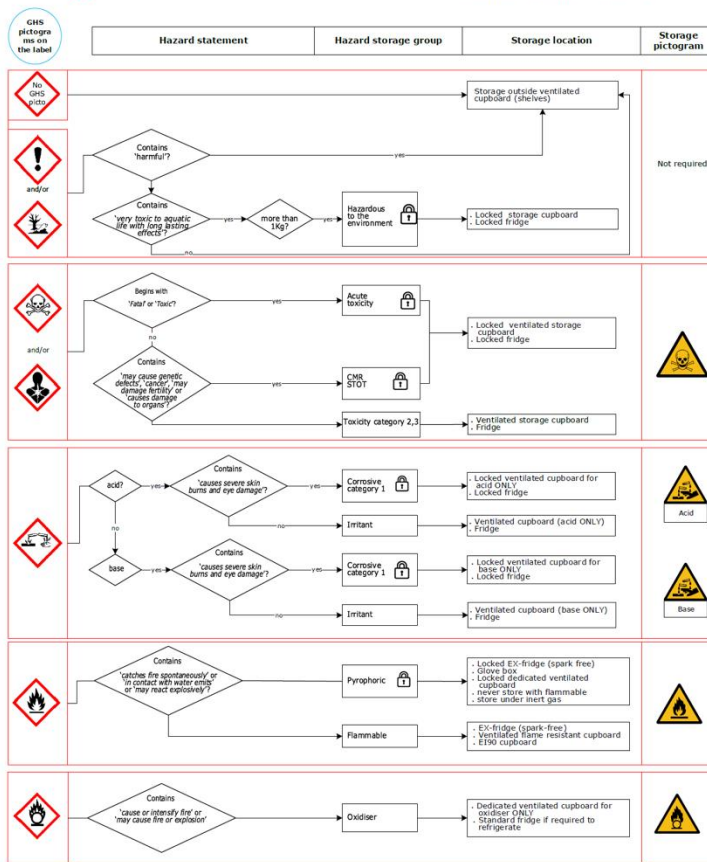
Acetic Acid, Glacial
Danger!
 Hazard Statements:
 H314 Causes severe skin burns and eye damage.
 H332 Harmful if inhaled.
 Precautionary Statements:
 P201+202 Attention: Read the label carefully before use and do not remove or alter the labels in any way.
 P231+232 Keep tightly closed to prevent moisture or air from entering.
 P233 Keep container closed when not in use.
 P240 Avoid contact with skin and eyes.
 P241 Avoid breathing dust/fume/gas/mist/vapors/spray.
 P242 Avoid contact with clothes.
 P243 Avoid contact with skin.
 P244 Avoid breathing dust/fume/gas/mist/vapors/spray.
 P273 Do not release into the environment.
 P501 Dispose of contents and container according to local, national, and international regulations.
 CAS No: 64-19-7
 EC No: 200-117-0
 Consult SDS for additional information on hazards.
 1
 LundPharmaceuticals
 207 Chapel Rd. Wallingford, ME 05493
 500 ml
 UN No: 2789
 Ex: Acetic acid-> store in a ventilated cupboard or E190 as flammable, separated from basic compound.

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		Green	Red	Yellow	Yellow	Yellow
Flammable		Red	Green	Red	Red	Yellow
Corrosive: ACID		Yellow	Red	Green	Red	Red
Corrosive: BASE		Yellow	Red	Red	Green	Yellow
Health hazard / toxic		Yellow	Yellow	Red	Yellow	Green


LEGEND

Not Compatible	Store according to SDS Section 7 and 10	Compatible
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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

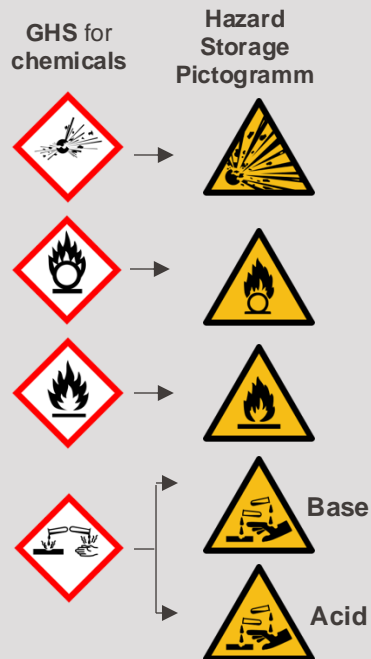
Note that two chemicals can have the same pictogram and still be incompatible!

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

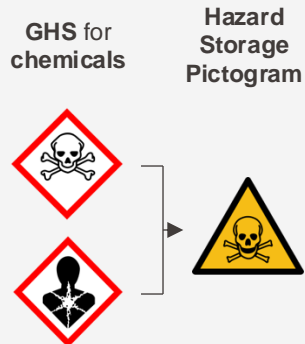
Display the corresponding hazard storage pictograms

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.:	Hazard pictograms
Solvent:	
Concentration:	
Name: contact person	

Date: 01.2020	
Molecule name or Lab notebook ref.: LNB06 page 9	 
Solvent: MeOH 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

Storage of chemicals (I)



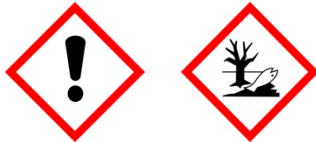
Separate liquid from solid chemicals.



Explosives and compressed gas are stored apart from other chemicals.



Chemicals with at least one of these pictograms must be stored in different **ventilated cabinets according to their hazard**. Flammable must be stored in **fireproofed cabinets** (e.g. EI 90). Oxidizers must be stored apart from other chemicals.



Chemicals with these two pictograms could be stored in **non-ventilated areas**.



Flammables which need to be stored at low temperatures must be stored in certified **Ex** fridges.

Use **retention trays** for all hazardous liquid chemicals (any pictogram).

Volume of the retention tray \geq volume of the biggest container stored.



Carefully **reseal** containers before returning to storage.

Replace broken, cracked or deteriorated caps.

Use Teflon tape OR “Parafilm” to limit emissions.



Use a **secondary container**, when using very smelly or highly volatile chemicals.



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

Tracing your chemicals

- An inventory required to ensure traceability of chemicals
 - An inventory audit is requested by the confederation
 - 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, updated every 6 month
 - The location must be known at least down to cabinet level

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 only for SB faculty units**
 - The module has not yet been deployed in the ENAC, SV and STI faculties (work in progress).
 - Other tools, such as Excel or Slims, are provisionally accepted.
- In all cases, an inventory must be taken at least every 6 months.

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

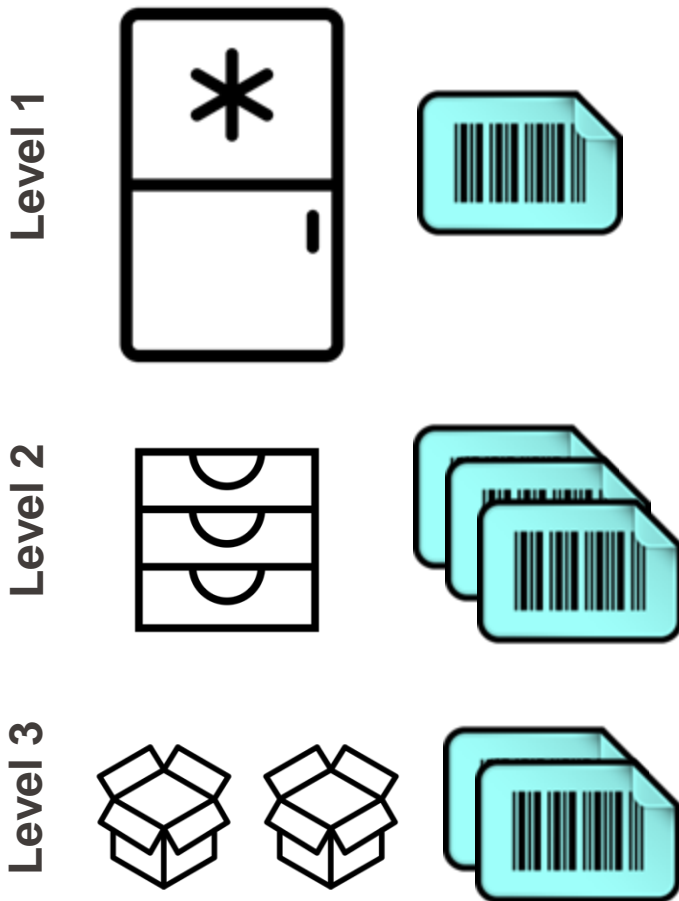
Create a bar-code for storage places of the chemicals

- Management of the bar-codes of the storage places

3 types available

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



How to do the inventory of chemicals ?

5.1 Shop indicates 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



5. Inspections of errors by the shop personal

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



Only for SB
ENAC, SV and STI are in the starting block



Attention to the bar-code of the product

Repeat for every storage place



3. Then scan the bar-code of every chemical

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



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



Thank you !