



MANIPULATION N°01

General notions

(Safety, Measuring Devices in the Chemistry Laboratory)



1- Introduction :

Working in a chemistry laboratory requires the application of a number of safety rules; these rules are essential for the organization of work in a laboratory. When you first enter the TP room, the student will need to know what to do, know how to dress and behave during a TP session, know the essential rules for handling equipment and chemicals, the glassware commonly used and know how to write your report.

2- Safety in the laboratory :

Working in a chemical laboratory exposes you to **risks** due both to potentially **toxic chemicals** and to the **materials used**, which an experimenter must know to use them without danger. You must therefore be aware of the risks involved and do everything to **protect others and yourself**, while keeping in mind that the danger can come from others.

3- Some general safety rules:

Simply entering a chemical laboratory requires **strict compliance with certain rules**

- Do not **smoke**.
- Do not **eat** or **drink**. Do not **chew** chewing-gum.
- Do not **taste** or **smell** the chemical products.
- Do not **clutter the floor** with various bags, satchels, etc. In particular, leave open the **driveways** and **access roads** to the emergency exits.
- Do not **clutter the straw** with notebooks, kit, etc.
- Do not **run** to the laboratory.
- Do not handle **alone**.
- Do not experiment with manipulation **without informing the teacher**.
- Manipulate **standing**.
- **Pipetting** in the **mouth** is prohibited, even for products deemed to be low-harm
- Do not use a **mobile phone**.
- Never pour water into a **concentrated acid** solution (risk of splashing and burn).
- It is also necessary to **wash your hands** regularly during a T.P. and systematically before leaving, temporarily or permanently, the laboratory.



Interdiction de fumer



Interdiction de manger ou boire

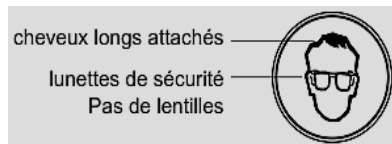
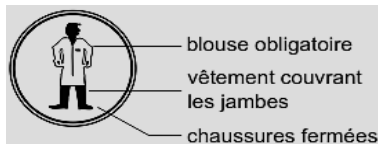
3-1. The chemist's outfit : Entry into a chemistry laboratory requires an appropriate **outfit** :

- **Pants** covering the legs and **closed flat shoes** to minimize the areas of skin exposed in the event of projections.
- **Long hair attached**.
- No **ring, bracelet, watch**.
- No **contact lenses** that can be attacked by volatile solvents.



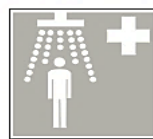
3-2. Personal Protective Equipment :

- **Safety glasses** or over-glasses placed on the **eyes at any time**.
- A **cotton blouse** that must be **buttoned** and have **long sleeves, (obligatory)**.
- **Gloves** to be used wisely.



3-3. Collective Protection Equipment :

- **The extractor hood**, harmful or toxic products by inhalation must be handled under an extractor hood.
- **The shower**, is generally at the entrance to the room and must be used in the event of a burn or extensive chemical projection. It is recommended to undress once underwater (unless the clothing sticks to the skin).
- **The eye rinse**, It should be systematically used in case of eye projection.
- **The fire blanket**, it allows to stifle the fire on a person. This requires preventing the person from running, placing them on the ground and choking the flammes with the blanket, protecting their own hands.

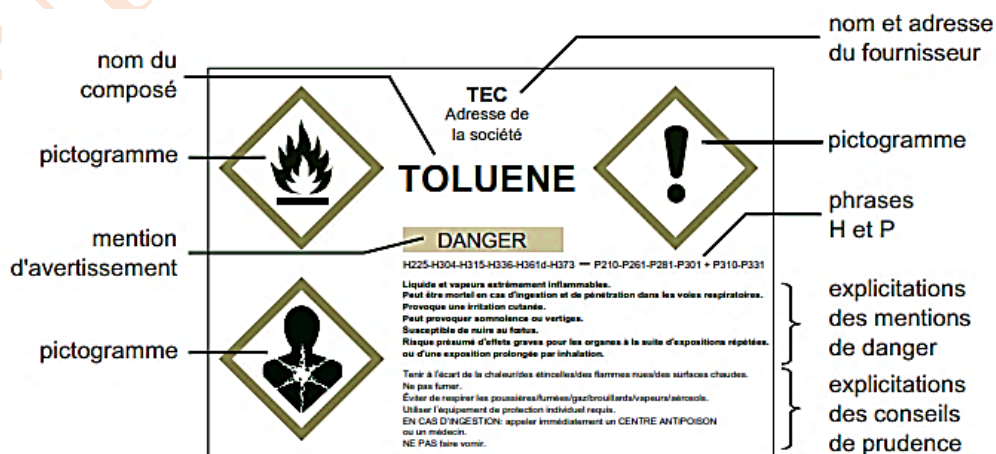


Pictogrammes localisant la douche de sécurité, le rince-œil et la couverture anti-feu.

3-4. Knowledge of the products used and the danger symbols: There are three main categories of hazards intrinsic to chemical substances:

- **physical dangers** (risk of explosion, inflammation, etc.).
- **health dangers** (acute toxicity, eye damage, reproductive toxicity, etc...).
- **Environmental dangers** (danger to aquatic environments).





The handling of chemicals is not safe. Packaging labels include **pictograms** (images) and **codes** presenting risks and safety instructions, the following image gives the example of a toluene label



Reproduction de l'étiquette d'une bouteille de toluène.



Danger pictograms :

Pictograms	Signification	Risks	Safety advice
	Substance Highly flammable	Auto-flammable substance Or easily flammable gas Or moisture-sensitive substance Or flammable liquid	Avoid contact with air Avoid formation of flammable vapour-air mixtures and contact with any source of ignition Keep away from flames, sparks and sources of heat.
	Substance Combustion	Promotes the ignition of combustible materials or sustains fires	Avoid any contact with combustible materials
	Substance Corrosive	Contact leads to the destruction of living tissue and materials	Avoid inhalation of vapours and contact with skin, eyes and clothing.
	Substance Toxic	Causes serious injury or death by inhalation, ingestion or skin contact	Avoid any contact with the body

4- Risks inherent in chemical products:

Danger	Safety rules	First Aid Gestures
Product swallowed	<ul style="list-style-type: none">Do not pipette by mouth.Use propipettes.	<ul style="list-style-type: none">Rinse the mouth.Do not drink.Do not vomit.
Projection into the Eye	<ul style="list-style-type: none">Use safety glasses.	<ul style="list-style-type: none">Rinse the eye held open under a stream of cold or warm water, head tilted, the eye contaminated below the healthy eye
Thermal burn	<ul style="list-style-type: none">No hair, no floating clothes.No synthetic clothing.Wear a COTTON blouse.	<ul style="list-style-type: none">Rinse immediately with cold water, 15 minutes.Keep clothes glued to the skin.
Chemical burn	<ul style="list-style-type: none">Wear a blouse.Use small quantities.Use the minimum concentrations necessary.Label the containers.Use gloves if necessary.	<ul style="list-style-type: none">Rinse immediately under cold running water.Remove contaminated clothing without touching the face.
Cut	<ul style="list-style-type: none">Use cloths and lubricate when threading a tube into a stopper.Discard cracked glassware.	<ul style="list-style-type: none">Compress locally to stop the haemorrhage.sit and reassure.
Fire	<ul style="list-style-type: none">Stuffed paillasse.Know how to use the fire extinguisher.fire extinguisher, wet coil and fire cover.	<ul style="list-style-type: none">Smother the fire.on a person: lay the person on the floor and cover with the fire cover.



5- How to manipulate chemical products :

1. **Before using a chemical product:** Read the label and follow the safety instructions associated with the product.

2. **Taking a solid:** You must use a metal spatula. Contacts with fingers are prohibited.

3. **To take a liquid, you need to:**

- Pour a small quantity into a beaker.
- Always recap a bottle after use.
- Use a pipette fitted with a pipettor to take a precise quantity.

4. **Before leaving, you need to:**

- Dispose of the solutions, if possible in the recovery bins.
- Clean the glassware (brushes on the sides of the experiment tables);
- Clean and arrange the palliase.

6- Some tools and instruments in the chemistry laboratory :



Graduated cylinder



Erlenmeyer Flasks



Beaker



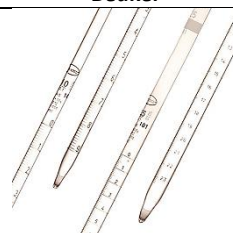
Round-bottom flask



Test tube



Volumetric flask



Graduated pipette



Burette



Volumetric pipette



Watch glass



Spatula



Dropper



Funnels



ProPipette



Wash bottles



Electronic balance