Chemical hazards

Collective protective equipment must be used before personal protective equipment. Indeed, the wearing of a mask in the laboratory protects the person and who manipulates but does not protect the other people present in the laboratory. Confined work under another aspirant removes the painfulness of wearing a mask and protects others.

The person handling bottles contains commercial products and exposed to chemical risks at any time. Before any manipulation of a bottle, it is advisable to :

- wear the appropriate protective equipment: cotton blouse, EEC approved protective glasses, protective gloves;
- handle vials under a ventilated hood (for concentrated acids or bases, for example) ;
- check the laboratory glassware before any manipulation to avoid cutting (chipped material) or breakage of the equipment during use (chipped glassware, chips, ...) ;
- Do not sample from the bottle. Transfer to a large clean beaker and annotate the volume necessary for the manipulations. This avoids ending up with (polluted solutions) ;

Safety pictograms, meanings and precautions

Symbols	Definitions	Examples	Precautions
Explosive 	Any product that can explode under the effect of a shock, friction or under the action of heat.	Gas (hydrogen, acetylene, propane, butane, LPG). Aerosols of all kinds (even empty) are power bombs made of 50°C fabric: air purifiers, hairsprays, paint, varnish, windshield defroster, etc. Picric acid, fireworks devices...	Avoid overheating to protect it from the sun. Do not store near a heat source, a lamp or a radiator.
Harmful 	This concerns products which, by inhalation, ingestion, or skin penetration, can cause poisoning, the severity of which depends on the product concerned and the dose received.	Turpentine, pesticides, moth repellents, bleach in effervescent tablets, solvents for varnishes.	Avoid any contact of the products with the skin (gloves, screens, overalls, etc.). Work in a well-ventilated room, under a hood or in the open air. Do not eat or even chew chewing gum. Wash hands after handling. Note : Aerosol products are the most dangerous.
Toxic 	Any product that, by inhalation, ingestion or skin penetration, can cause serious, acute or chronic risks and even death.	What differentiates toxicity is the dose from which the risk exists. Methanol, alcohol for burning, stain remover Disinfectant (crealine) Pesticides Carcinogens: zinc oxide, ethylene oxide, zinc chromates, asbestos Stain removers, trichloroethylene Paint removers Carbon monoxide Mercury Chlorine Hydrocyanic Acid Cyanide	
Very toxic 	Any product that, by inhalation, ingestion or skin penetration, can lead to extremely serious, acute or chronic risks and even death.		
Easily flammable 	This concerns products that can ignite easily in contact with a flame, a heat source (hot surface) or sparks.	Oil Turpentine Diluted ethyl alcohol Formalin	Store all products in a well ventilated room. Avoid using the product near a heat source, a hot surface, sparks or an open flame. Do not wear synthetic fabric clothing. Have a fire extinguisher at hand. Always keep flammable products, classified (F), away from oxidizing agents, classified (O).
Extremely flammable 	Any product that can ignite very easily in contact with an energy source (flame, spark, etc.), even at negative T°.	Essence Alcohol for burning Pure ethyl alcohol Acetone Ether	

Oxidizer 	Any product which, in contact with others, in particular the flammable substances, causes a strongly exothermic reaction. Under the usual term, oxidizers are oxygen-rich materials that have the property of maintaining combustion and, consequently, tatizing fires.	Hydrogen peroxide and other peroxides Chlorates, permanganates, nitric and perchloric acids	
Risk of biological contamination 	For humans: risk of contamination linked to the presence of a pathogen or a GMO. For the environment: risk of contamination linked to the presence of a pathogen or a GMO (genetically modified organism).	Blood Bacterial cultures Protozoa	at the sight of this symbol, respect the rules of asepsis. Wash hands with soap and water after handling. In the event of an accident (spill on the benchtop, cut with contaminated equipment,...), wash and disinfect the wound and/or the work surface. Protect cuts or wounds with latex or vinyl gloves. Keep the products in the original packaging (hermetically sealed container, safety cap). Store the products well, never place them on the windowsill or near a table or bench edge. Protect the skin and eyes from splashes. Always use gloves and protective glasses. Always wash hands but and face well after handling. In case of emergency, rinse the affected parts thoroughly with water for 10 minutes.
Irritating 	This concerns products without corrosives which, by inhalation, ingestion, or by immediate, prolonged or repeated contact with the skin, eyes, mucous membranes, can cause an inflammatory reaction.	Ammonia, diluted bleach, dishwashing detergents, methanol-based window washers.	
Corrosive 	The expression (corrosive products) applies to substances that have the power to damage living tissues (in particular what the human organism) and to attack other materials such as metals and wood	Unblocker for pipes Descalers Caustic soda Strong acid, sulfuric acid (batteries) Strong bases (weld) Oven cleaners, toilet Products for dishwashers (in the wet state)	
Radioatives materials 	Radioactivity i a phenomenon related to the structureof matter. Some atoms (radioelements) are unstable and emit ionizing radiation which, during their interaction with matter, can ionize it, that is to say that is to say remove one or more electrons from its atoms.	Cosmic radiation Telluric radiation (from the ground) Radioelements Radioactive leaks Radiology Nuclear medicine	Do not use sources of boigner ionizing radiation if there are other alternatives (for example, no X-ray if similar results are obtained with an ultrasound). Look for the minimum necessary exposure. Do not exceed the daily or annual exposure limits. Reduce the duration of exposure to radiation as much as possible. Move away from the source of radiation because their intensity decreases with the square of the distance. When possible, put one or more screens between the radiation source and people.
Dangerous for the environement 	These are substances and preparations which, if they entered the environment, would present or could present	Some active ingredients of pesticides (organochlorine compounds : lindane, parathion) and weed killers CFCs (chlorofluorocarbons)	These are substances and preparations which, if they entered the environment, would present or could present an immediate or deffered risk for one or more

	an immediate or deffered risk for one or more components of the environment (air, water, soil, fauna, flora). These substances and preparations can be: very toxic to aquatic organisms or soil, toxic to wildlife, dangerous to the air, for example the ozone layer (skin cancer, cataracts).	Certain solvents (thiodicresol) Certain heavy metal compound (copper methanesulfonate) PCBs (polychlorinated biphenyls) PCT (polychlorinated terphenyls)	components of the environment (air, water, soil, fauna, flora). These substances and preparations can be: very toxic to aquatic organisms or soil, toxic to wildlife, dangerous to the air, for example the ozone layer (skin cancer, cataracts).

Biological hazards

- This picogram is present at the entrance to a microbiology or biology laboratory, as well as containers intended to receive waste (petri dish and plastic, Pasteur pipette, hemolysis tube, etc.) or biological products (all samples to be analyzed, blood sampling,...).
- It means the probable contamination by a biological agent of a known or unknown nature (bacteria, protozoa, viruses, etc.).
- at the sight of this symbol, respect the rules of asepsis, wash your hands with soap and water after handling (gloves disinfection of worktops and soiled equipment).
- In the event of an accident (spill on the benchtop, cut with contaminated equipment,...) wash and disinfect the wound and/or the work surface.
- Protect wounds with a bandage or latex or vinyl gloves. 
- Keep the vaccination record up to date.
- Genetic engineering : the risks of mutation, genetic manipulations are new risks that must be evaluated.

Radiological risks : 

Pictogram present in all radiology laboratories whose radiation poses a danger, whether for short-term or long-term exposure. -risks related to the use of radiation (α, β, γ) and non-ionizing (UV and IR)

Electrical hazards :

Direct or immediate physiological effects of electric current:

Electrification refers to the various physiological and pathophysiological manifestations due to the passage of electric current through the human body,

Electrocution and a deadly electrification,

Arc burns are caused by the intense heat released during the production of an electric arc.

Technical measures: the classes of electrical equipment:

- The equipment used must be of class I (symbol ⏚) that is to say equip with a protective conductor (green / yellow color of the earth conductor)

- or at a pinch it can be Class II, (

)that is to say to have a double in isolation. In this case, it must not be grounded.

- The Class III equipment operates under an alternating voltage of 48 Volts very low safety voltage.

- the use of class 0 (zero) equipment, that is to say not comprising a protective transducer (⏚) or not being repaired by the class II (--) symbol is strictly prohibited at workplaces.

Alternating voltages (50 Hz) at 50 volts are dangerous for humans.

Necessary equipment:

- Sensitive differential circuit breaker.
- Electric emergency stop button (punch).

Mechanical Risks