

Safety in chemistry

Printable revision sheet — Galaxscia

LEVEL 1

Safety in chemistry

Why does safety matter?

In chemistry, some substances and reactions can be **dangerous** to health or cause accidents. It is therefore essential to know and follow the **safety rules** in order to work safely in a laboratory.

Examples: - Handling an acid without safety goggles can cause burns to the skin or the eyes. - Heating a chemical without care can cause splashes or violent reactions.

The basic safety rules

To work in a laboratory, you must always:

Basic laboratory rules

Wear safety goggles

To protect yourself

Read the label

Identify the danger

Do not taste / smell

Avoid exposure

Use a fume hood if needed

Limit vapors

Clean / sort

Store and dispose

Warn an adult

React safely

Wear personal protective equipment: goggles, gloves, lab coat

Never taste or smell chemicals: some products are toxic even in small doses

Read the labels and hazard pictograms: they show the danger and how to use the product

Work under a fume hood: this avoids breathing in dangerous vapours

Never work alone: always with a classmate or an adult

Follow the storage and disposal rules: some products need special sorting

The hazard pictograms

Chemicals carry pictograms showing how **dangerous** they are. The main ones are:



Corrosive: destroys and eats away living tissue or materials

CMR: carcinogenic, mutagenic, toxic for reproduction.

Hazardous to the environment: destroys or pollutes the environment.

Harmful/irritant: can cause irritation, bad for health.

Toxic: can cause death in small doses.

Flammable: can catch fire in the presence of heat.

Oxidising: makes burning easier.

Gas under pressure: container under pressure.

What to do in case of an accident

In a laboratory it is essential to know how to react quickly:

In case of a chemical burn: rinse the area immediately with water for several minutes.

In case of a splash in the eyes: use the eyewash station and tell an adult.

In case of fire: use the right extinguisher and raise the alarm.

Never run in the laboratory, to avoid making accidents worse.

Key points — revision questions

Why is it important to follow the safety rules in chemistry?

Which items of personal protective equipment are essential?

Name 3 hazard pictograms and what they mean.

What should you do in case of a chemical burn or a splash in the eyes?

Why must you never work alone in a laboratory?

LEVEL 2

The danger of acids and bases

Acids (hydrochloric acid, sulfuric acid...) and **bases** (sodium hydroxide, ammonia...) are often **corrosive**: on contact with the skin or the eyes they cause **chemical burns**. The more **concentrated** the solution, the greater the danger.

Always wear goggles and gloves to handle an acid or a base.

In case of a splash on the skin or in the eyes: rinse with plenty of water for several minutes and tell an adult.

Reading the label of a household product

Many household products are acids or bases: drain cleaners (strong base), descalers and limescale removers (acids), bleach... Their **label** carries **hazard pictograms** (corrosive, harmful) and safety instructions that must be followed.

Warning: never mix bleach with a descaler (an acid): the mixture gives off a **toxic gas** (chlorine).

What should I do if...?

Splash in the eyes

Rinse thoroughly and inform an adult.

Unknown product

Read the label and pictograms.

Bleach + descaler

Never mix them: toxic gas release.

Key points — revision questions

Why are concentrated acids and bases dangerous for the skin and the eyes?

What is the right reflex if an acid or a base is splashed?

Where do you read the dangers of a household product, and what should you look for?

Why must bleach and descaler never be mixed?

LEVEL 3

Storing and disposing of chemicals

In the laboratory, the **storage** of products follows precise rules: containers **closed and labelled, incompatible products kept apart** (acids away from bases, oxidisers away from flammables), out of heat and light.

Chemical waste must **never be poured down the sink**: it is collected in **waste containers** suited to its nature, then treated by a specialist service.

Precautions for acid-base and acid-metal reactions

Acid + metal: the reaction gives off hydrogen, a flammable gas. Work away from any flame and under a fume hood.

Acid + base: the reaction is exothermic (it gives off heat) and can cause splashes. Always pour the acid into the water, slowly, and never the other way round.

Key points — revision questions

Which rules must be followed when storing incompatible chemicals?

Why is chemical waste not poured down the sink?

Which dangerous gas is given off in an acid + metal reaction, and what precaution should be taken?

Why do you always pour the acid into the water and never the water into the acid?