Chemistry Reactions 1- Learning journey KS3

Acids and Alkalis	pH Scale and Indicators	Acid Strength	Reactions of Metals with Acid	Neutralisation	Making Salts

Key Words

Key Word	Definition
pH Scale	Measure of the strength of an acid or an alkali
Indicator	Substances used to identify whether unknown solutions are acidic or alkaline.
Strong acid	An acid that fully ionises in water to release H^+ ions
Weak acid	An acid that partially ionises in water to release H^+ ions
Concentration	Measure of the number of particles in a given volume.
Neutralisation	A chemical reaction between an acid and a base/alkali in which it produces a neutral substance
Excess	More than needed
Base	A substance that neutralises an acid
Alkali	A substance that neutralises an acid and dissolves in water
Ionises	Molecules split to form charged particles.

Misconceptions

A base and an alkali aren't the same

Acids and metals make salt and hydrogen. Acids and alkalis make salts and water.

Key questions

Describe the method to produce copper sulfate from copper oxide and sulfuric acid

Give the word equation for neutralisation

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Acids and Alkalis

Acids:

- pH between 0-6
- Taste sour
- Releases H^+ ions when dissolved in water
- Everyday acids = Lemons, limes, vinegar, battery acid and stomach acid
- Laboratory acids = hydrochloric acid, nitric acid and sulfuric acids

Alkalis / bases:

- pH between 8-14
- Feels soapy
- Releases OH^+ ions when dissolved in water
- Everyday alkalis = cleaning products and indigestion tablets
- Laboratory alkalis/bases = sodium hydroxide, potassium hydroxide
- Laboratory bases = sodium oxide, potassium oxide

Acid Strength

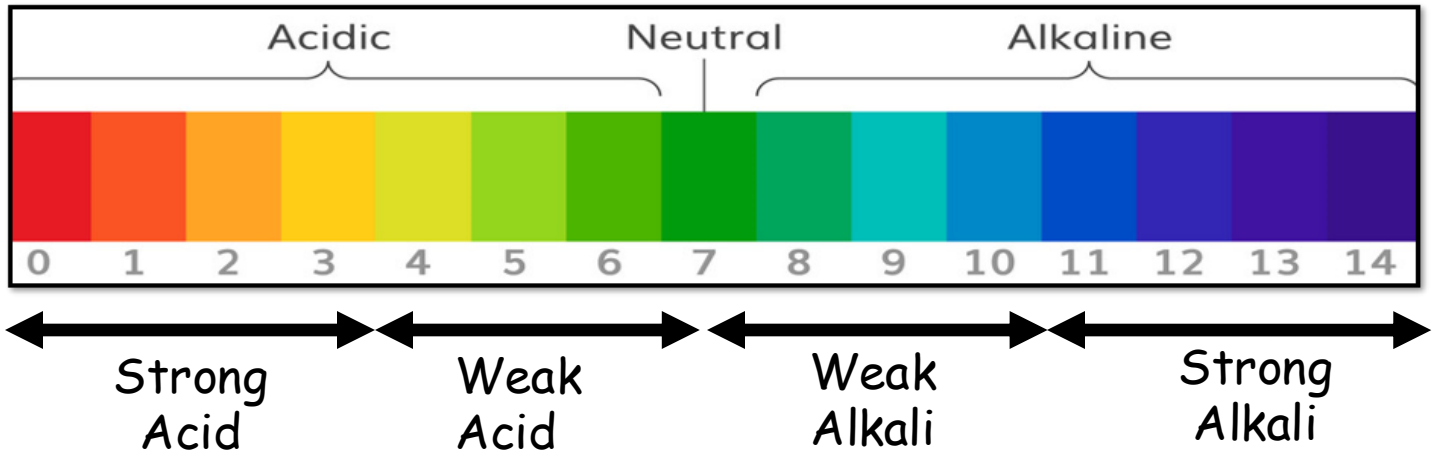
Strong acids fully ionises to release H+ ions.

Weak acids partially ionises to release H+ ions.

When metals react with stronger acids the reaction is quicker.

As the pH decreases by 1 (gets more acidic), the H+ concentration increases by a factor of 10.

pH Scale



Indicators

You get the colours seen on the pH scale when using universal indicator paper / solution.

When using litmus paper you get the following observations:

Substance	Blue Litmus	Red Litmus
Acid	Red	Red
Alkali	Blue	Blue

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Reactions with Acids

Hydrochloric acid makes metal chloride salts
Sulfuric acid makes metals sulfate salts
Nitric acid make metal nitrate salts

Acids and metals

Metals + **A**cid → **S**alt + **H**ydrogen (MASH)
Example:
Sodium + hydrochloric acid → sodium chloride + hydrogen

Acids and Alkali / Bases

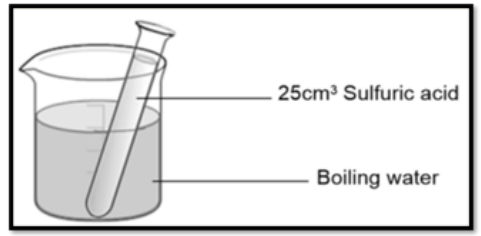
Alkalis + Acid → Salt + Water
Example:
Sodium hydroxide+ hydrochloric acid → sodium chloride + water

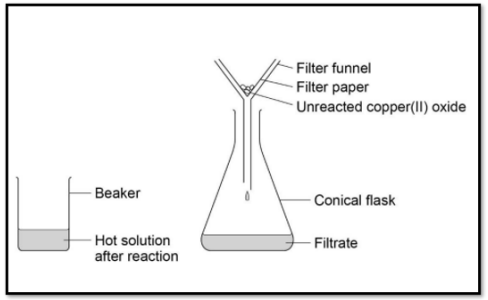
Hazard Symbols

Symbol	Hazard	Meaning
	Health hazard	This includes irritants, harmful substances, and some low-hazard substances
	Corrosive	This symbol means that the chemical can burn through surfaces and our skin.
	Dangerous to the environment	This will damage living things if it gets into the water.
	Toxic	This can be poisonous and possibly deadly

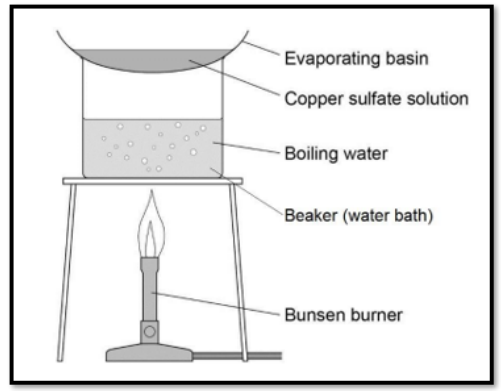
Making Salts

1.Add 25cm3 of sulfuric acid to a boiling tube and heat gently using water from a kettle
2.Transfer the acid to a beaker
3.Add copper oxide ¼ a spatula at a time and stir. Keep doing this until no more copper oxide will react, it is then in excess





4. Filter solution using a funnel and filter paper and pour into evaporating basin



5.Place evaporating basin on a gauze and heat gently until ½ the liquid has evaporated.
6.Pour into crystallising dish and allow to cool.
7.Remove crystals and pat dry using filter paper.