

Acids, Bases & Salts

IGCSE Chemistry ■ Topic 7

IGCSE Chemistry



What we will cover

1 Acids & their reactions

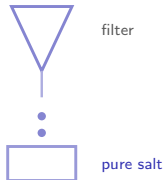
2 Indicators

3 Strong vs weak acids

4 The pH scale

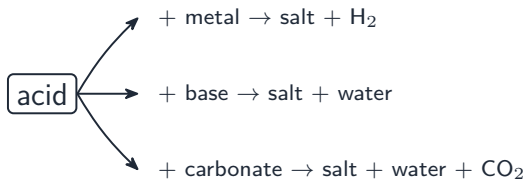
5 Oxides

6 Preparing salts



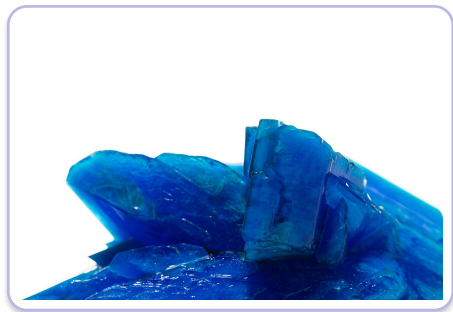
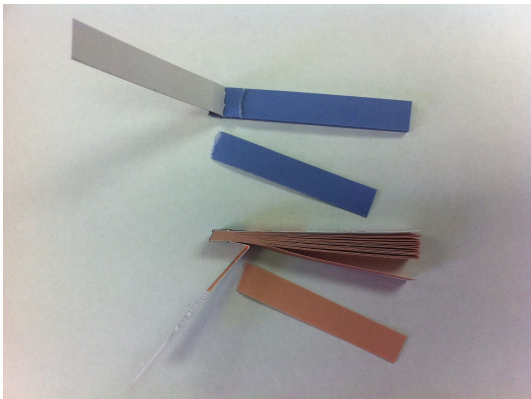
preparing salts

Acids and their reactions



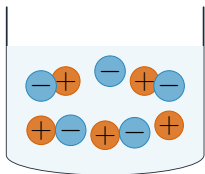
Indicators estimate the pH of a solution

Indicators

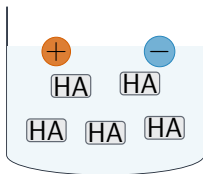


Salts form crystals from solution

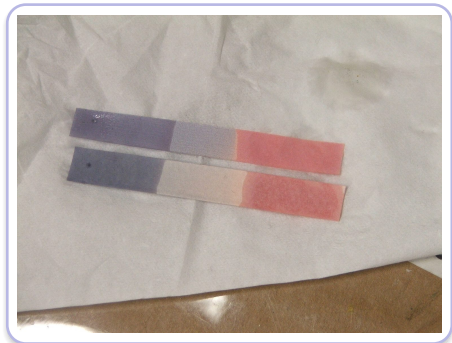
Strong vs weak acids



strong acid
fully split into
ions (e.g. HCl)

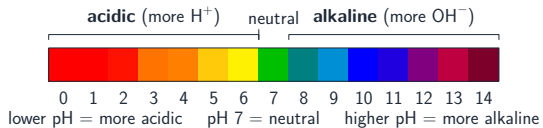


weak acid
mostly molecules,
few ions (e.g.
ethanoic acid)



Litmus shows acid or alkaline conditions

The pH scale



Oxides and carbonates are important compounds

Oxides

acidic

non-metal oxides
(SO_2 , CO_2)

basic

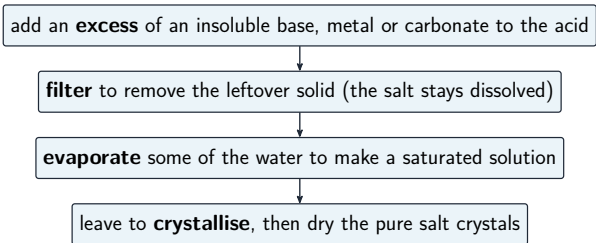
metal oxides
(CuO , CaO)

amphoteric 两性

react with both
(Al_2O_3 , ZnO)

Metal oxides tend to be basic; non-metal oxides tend to be acidic.

Making a soluble salt

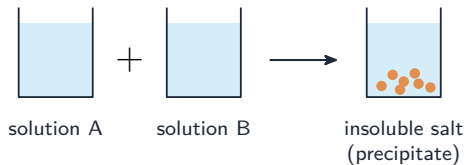


React acid with **excess** solid
(metal, base or carbonate):

- 1 add excess, then **filter** 过滤
- 2 **evaporate** 蒸发 some water
- 3 **crystallise** 结晶

An alkali needs **titration** 滴定 instead.

Making an insoluble salt



By **precipitation** 沉淀: mix two solutions that each carry one needed ion.

The insoluble salt appears as a solid – then filter, wash & dry it.

Worked example – choosing a salt preparation

How would you prepare (a) copper(II) sulfate and (b) lead(II) sulfate?

- (a) Copper(II) sulfate is **soluble**: add **excess** insoluble copper(II) oxide to warm sulfuric acid.
- Filter off the excess, then **crystallise** the filtrate.
- (b) Lead(II) sulfate is **insoluble**: mix two **solutions** (lead nitrate + sodium sulfate).
- **Precipitation**: filter, wash and dry the solid.

Ask “**is the salt soluble?**” first. Soluble $\Rightarrow$ acid + excess solid, filter, crystallise. Insoluble $\Rightarrow$ mix two solutions and filter the precipitate.

Topic 7 – key takeaways

1 Acids

make H^+ ; react with metals, bases, carbonates

2 Strong/weak

full vs partial dissociation (not conc.)

3 pH

< 7 acid, 7 neutral, > 7 alkali

4 Salts

soluble: filter/evaporate;
insoluble: precipitate

Check yourself

- 1 What gas forms when an acid reacts with a metal?
- 2 What does “strong acid” mean?
- 3 What is the pH of a neutral solution?
- 4 How do you make an insoluble salt?



Answers 1. hydrogen 2. fully dissociated into ions 3. 7 4. precipitation – mix two solutions