

Exercise walk-through

7.2

Oxides

IGCSE Chemistry

Oxides

acidic

non-metal oxides
(SO_2 , CO_2)

basic

metal oxides
(CuO , CaO)

amphoteric

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**
- 2 **evaporate** some water
- 3 **crystallise**

An alkali needs **titration** instead.

add an **excess** of an insoluble base, metal or carbonate to the acid

filter to remove the leftover solid (the salt stays dissolved)

evaporate some of the water to make a saturated solution

leave to **crystallise**, then dry the pure salt crystals

Describing what you see, and water in salts

bubbles of gas

say **effervescence** – fizzing and bubbling are also accepted

the solid getting smaller

say the solid **dissolves** or **disappears**

a colour change

name **both** colours – from blue to colourless, not just “it changes”

heat given out

the mixture **warms** – an exothermic reaction

hydrated

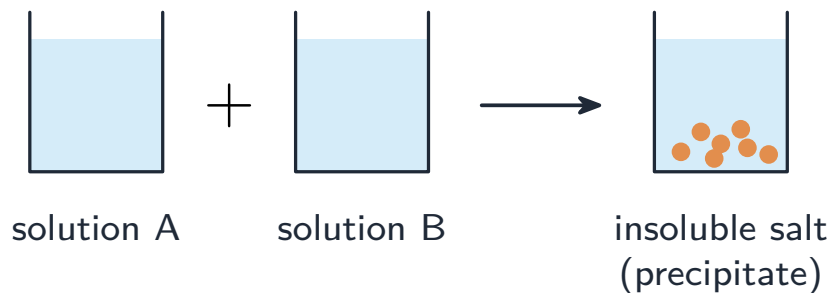
a substance **chemically joined with water** – blue copper(II) sulfate crystals

anhydrous

a substance containing **no** water – the same salt, white, after heating

Observations are marked separately from equations. Write what a person watching would actually be able to report.

Making an insoluble salt



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

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

Bases and alkalis



pH strips: alkalis turn universal indicator purple or blue ($\text{pH} > 7$)

Exercises 2.1·2.2

2.1 State whether copper(II) oxide is acidic or basic.

[1]

2.2 Name one amphoteric oxide.

[1]

Exercises 2.1·2.2

2.1 State whether copper(II) oxide is acidic or basic.

[1]

2.1

- copper(II) oxide is a metal oxide
 - it is **basic**
-

2.2 Name one amphoteric oxide.

[1]

2.2

- e.g. **aluminium oxide** Al_2O_3 or **zinc oxide** ZnO

Exercise 3.1

3.1 Which oxide is acidic?

[1]

☐

A CaO

B Na₂O

C SO₂

D CuO

Exercise 3.1

3.1 Which oxide is acidic?

[1]

☐

A CaO

B Na₂O

C SO₂

D CuO

3.1 C

- SO₂ is a **non-metal oxide**, so it is **acidic**
- A, B and D are metal oxides (basic)

Exercise 3.2 (a)

3.2 Aluminium oxide is amphoteric.

(a) State what 'amphoteric' means.

[1]

Exercise 3.2 (a)

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(a) State what 'amphoteric' means.

[1]

(a)

- **amphoteric** means it reacts with **both acids and bases** (to form a salt and water)

Exercise 3.2 (b)

3.2 Aluminium oxide is amphoteric.

(b) State the type of substance you would react it with to show its acidic behaviour. [1]

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(b) State the type of substance you would react it with to show its acidic behaviour. [1]

(b)

- react it with a **base** (or alkali)

Exercise 3.3

3.3 Predict whether magnesium oxide is acidic or basic, and write the product when it reacts with hydrochloric acid. [3]

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3.3

- magnesium oxide is a metal oxide, so it is **basic**
- it reacts with HCl to form **magnesium chloride and water**