Solutions

Marking: **M1** a correct method, **A1** the correct answer, **B1** an independent mark.

Each answer shows the steps, then the **result**.

2.1

- Na_2O **basic**
- CO_2 **acidic**
- Al_2O_3 **amphoteric**

2.2

- **acidic**
- sulfur is a **non-metal**

2.3

- **magnesium nitrate**
- $MgO + 2HNO_3 \rightarrow Mg(NO_3)_2 + H_2O$

2.4

- **red** or orange
- phosphorus oxide is a **non-metal oxide**, so it forms an **acidic** solution

3.1

B

- reacts only with acid, so it is basic: a metal oxide that is not amphoteric

3.2

B

- it reacts with both an acid and a base

3.3

(a) **acidic**

(b)

- $CO_2 + 2NaOH \rightarrow Na_2CO_3 + H_2O$

(c) **sodium carbonate**

3.4

(a) **Y**

(b)

- **X**
- it reacts only with an **alkali**, so it is **acidic**

(c) **Y**

3.5

(a) it reacts with **both** acids and bases

(b)

- $ZnO + 2HCl \rightarrow ZnCl_2 + H_2O$

(c) a **zincate** (sodium zincate)

(d)

- add **excess sodium hydroxide** solution and stir; the zinc oxide dissolves
- **filter**: copper(II) oxide is the residue
- **wash** with distilled water and **dry**

(e) copper(II) oxide is **basic**, so it would **also react** with (dissolve in) the acid