

Exercise walk-through

2.3

Acids salts and chemical tests

Pearson Edexcel · International GCSE · Chemistry

1

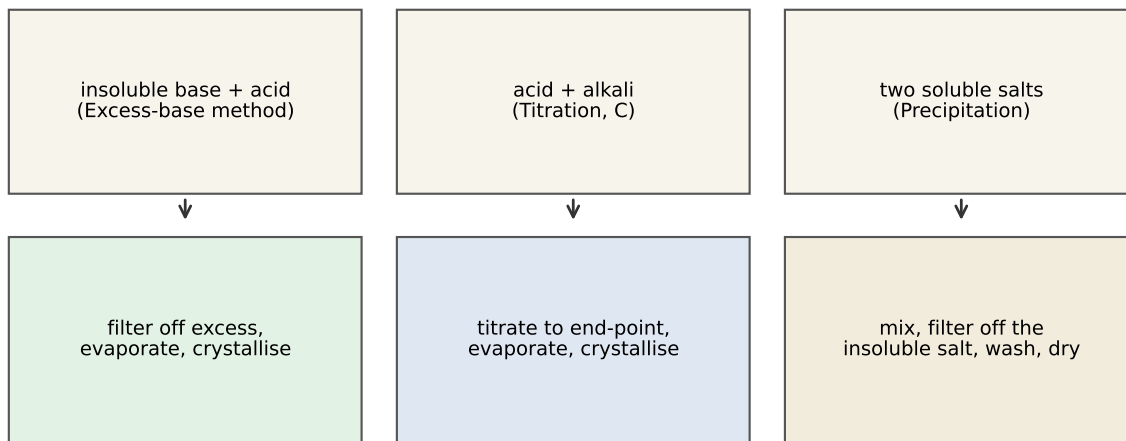
The method

Method — Salts by the right route

Soluble salt, insoluble base ($\text{CuO} + \text{H}_2\text{SO}_4$): warm, add excess base, filter, evaporate, crystallise. (C) Acid + alkali: titrate with indicator to the end-point, evaporate. (C) Insoluble salt: precipitation from two soluble salts, filter, wash, dry.

Method — Salts by the right route

Soluble salt, insoluble base ($\text{CuO} + \text{H}_2\text{SO}_4$): warm, add excess base, filter, evaporate, crystallise.



Three salt-preparation routes matched to the reactants available.

Exercises 2.1·2.3

2.1 State the colour change of phenolphthalein when alkali is added to acid. [1]

2.2 Name the two insoluble chlorides and the main insoluble sulfate. [3]

2.3 Write the equation for zinc oxide reacting with hydrochloric acid. [2]

Exercises 2.1·2.3

2.1 State the colour change of phenolphthalein when alkali is added to acid. [1]

2.1 Colourless to pink.

2.2 Name the two insoluble chlorides and the main insoluble sulfate. [3]

2.2 Silver chloride and lead(II) chloride; barium sulfate.

2.3 Write the equation for zinc oxide reacting with hydrochloric acid. [2]

2.3 $\text{ZnO} + 2\text{HCl} \rightarrow \text{ZnCl}_2 + \text{H}_2\text{O}$.

Exercises 2.4·3.1

2.4 Describe the positive result for the carbonate test. [2]

2.5 (C) In a titration, what is added from the burette, and what shows the end-point?[2]

3.1 Describe how to prepare a pure, dry sample of copper(II) sulfate crystals from copper(II) oxide and dilute sulfuric acid, naming each step in order. [5]

Exercises 2.4·3.1

2.4 Describe the positive result for the carbonate test. [2]

2.4 Effervescence/fizzing with dilute acid; the gas turns limewater milky – it is CO_2 .

2.5 (C) In a titration, what is added from the burette, and what shows the end-point?[2]

2.5 (C) The acid (of known concentration) from the burette; the indicator changes colour permanently (e.g. methyl orange yellow, phenolphthalein pink).

3.1 Describe how to prepare a pure, dry sample of copper(II) sulfate crystals from copper(II) oxide and dilute sulfuric acid, naming each step in order. [5]

3.1 Warm the dilute sulfuric acid and stir in copper(II) oxide until no more dissolves – excess base proves the acid is all used; filter off the unreacted black oxide; evaporate the filtrate to the crystallisation point; leave to crystallise and dry the blue crystals on filter paper.

Exercises 3.2·3.3

3.2 Describe tests to distinguish between chloride, bromide and iodide ions in solution, giving all observations. [4]

3.3 (C) Lead(II) nitrate solution is mixed with sodium sulfate solution. Write the equation, state the observation, and name the method used to collect the product. [3]

Exercises 3.2·3.3

3.2 Describe tests to distinguish between chloride, bromide and iodide ions in solution, giving all observations. [4]

3.2 Acidify each solution with dilute nitric acid, add silver nitrate solution; chloride gives a white precipitate, bromide cream, iodide pale yellow.

3.3 (C) Lead(II) nitrate solution is mixed with sodium sulfate solution. Write the equation, state the observation, and name the method used to collect the product. [3]

3.3 (C) $\text{Pb}(\text{NO}_3)_2 + \text{Na}_2\text{SO}_4 \rightarrow \text{PbSO}_4\downarrow + 2\text{NaNO}_3$; a white precipitate forms; precipitation – collect by filtration, wash and dry.