

11. Group 17

11.2 The chemical properties of the halogen elements and the hydrogen halides

Paper 2

Question Paper

1 (c) Iodine is made by reacting bromine with sodium iodide.

(i) Construct an ionic equation for the reaction of bromine with sodium iodide.

..... [1]

(ii) State the role of bromine in the reaction. Explain your answer.

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..... [1]

2 Chlorine is one of the elements in Group 17 of the Periodic Table.

(a) (i) Describe the colours of the Group 17 elements, chlorine to iodine, at room temperature.

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..... [1]

(ii) Describe the relative reactivity of the elements chlorine to iodine as oxidising agents.

..... [1]

(iii) State what is observed when chlorine reacts with hydrogen.

..... [1]

(iv) Explain why the thermal stability of the hydrogen halides decreases down the group.

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..... [1]

3 Magnesium shows reactions typical of a Group 2 metal.

(d) When 1 cm³ of MgCl₂(aq) is added to 1 cm³ of Br₂(aq) in a test-tube, the solution remains orange.

Explain this observation.

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..... [1]

- 4** A Group 2 metal combines with bromine to form a crystalline solid, MBr_2 .

Excess aqueous $AgNO_3$ is added to a solution of MBr_2 and a precipitate forms. The mixture is filtered. The precipitate is dried and the mass of the precipitate is recorded.

- (d)** A sample of MBr_2 is dissolved in water. Chlorine gas is then bubbled into the solution.

(i) Describe the observations for this reaction.

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..... [1]

- 5** Iodine is used in many inorganic and organic reactions.

(a) (ii) Explain why HI is the **least** thermally stable of HCl, HBr and HI.

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..... [1]

- 6** Group 17 elements are commonly referred to as the halogens.

(b) (i) State the conditions required for chlorine to react with hydrogen at room temperature.

..... [1]

(ii) On heating, iodine reacts with hydrogen in a reversible reaction.

Give the equation for this reaction. Include state symbols.

..... [2]