2.26 Tests for Ions, Gases and Flame Tests: 10-minute Pack

Total Marks

AQA 8464 · Calculator allowed · about 10 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 A flame test can be used to identify some metal ions from the colour they produce in a Bunsen flame.

(a) State the flame colour produced by lithium ions, Li^+. **(1)**

(b) State the flame colour produced by sodium ions, Na^+. **(1)**

(c) State the flame colour produced by potassium ions, K^+. **(1)**

(d) State the flame colour produced by calcium ions, Ca^{2+}. **(1)**

(Total for Question 1 is 4 marks)

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2 Suggest why a flame test on this mixture might not clearly show the flame colours of both metal ions present.

(Total for Question 2 is 2 marks)

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3 Sodium hydroxide solution is added dropwise to two separate solutions, one containing calcium ions, Ca^{2+}, and one containing aluminium ions, Al^{3+}.

(a) State what would be observed if excess sodium hydroxide solution is added to the solution containing calcium ions. **(1)**

(b) Write a balanced ionic equation, including state symbols, for the reaction between aluminium ions and hydroxide ions to form the white precipitate. **(2)**

(Total for Question 3 is 3 marks)

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Mark scheme · 2.26 Tests for Ions, Gases and Flame Tests: 10-minute Pack

Question 1

(a) red (crimson) (oe, cao) **B1**

(a) Answer: Red (crimson).

(b) yellow (oe, cao) **B1**

(b) Answer: Yellow.

(c) lilac (oe, cao) **B1**

(c) Answer: Lilac.

(d) orange-red (brick-red) (oe, cao) **B1**

(d) Answer: Orange-red (brick-red).

Question 2

one flame colour may be much stronger/more intense than the other (oe) **B1**

so it can mask/hide the weaker colour, making it difficult to see or identify both ions present (oe) **B1**

Answer: A stronger flame colour from one ion can mask the weaker colour of the other, making both ions difficult to identify.

Question 3

(a) the white precipitate remains (does not dissolve/redissolve) (oe, cao) **B1**

(a) Answer: The white precipitate remains and does not dissolve.

(b) correct formulae and balance: $Al^{3+} + 3OH^- \rightarrow Al(OH)_3$ **M1**

(b) correct state symbols: $Al^{3+}(aq) + 3OH^-(aq) \rightarrow Al(OH)_3(s)$ (cao) **A1**

(b) Answer: $Al^{3+}(aq) + 3OH^-(aq) \rightarrow Al(OH)_3(s)$

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