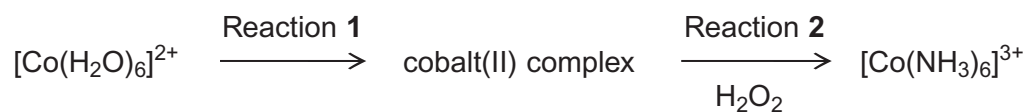


7 Hydrogen peroxide is used as an oxidising agent in the preparation of transition metal complexes.

7 (a) Consider the following reaction scheme. All the complexes are in aqueous solution.



7 (a) (i) Identify a reagent for Reaction 1 and describe the colour change that occurs.

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(3 marks)

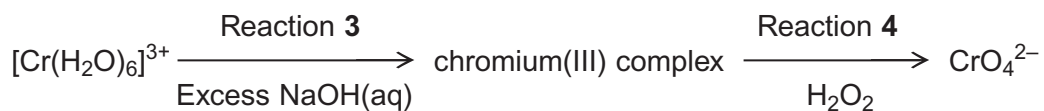
7 (a) (ii) State the colour of the final solution formed in Reaction 2.

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(1 mark)



- 7 (b)** Consider the following reaction scheme. All the complexes are in aqueous solution.



- 7 (b) (i)** For Reaction 3, state the colour of the initial and of the final solution and write an equation for the reaction.

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(4 marks)

- 7 (b) (ii)** Write a half-equation for the reduction of hydrogen peroxide to hydroxide ions.
Deduce an overall equation for Reaction 4 and state the colour of the final solution.

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(4 marks)

Question 7 continues on the next page

Turn over ►



- 7 (c)** The concentration of a hydrogen peroxide solution can be determined by titration with acidified potassium manganate(VII) solution. In this reaction the hydrogen peroxide is oxidised to oxygen gas.

A 5.00 cm^3 sample of the hydrogen peroxide solution was added to a volumetric flask and made up to 250 cm^3 of aqueous solution. A 25.0 cm^3 sample of this diluted solution was acidified and reacted completely with 24.35 cm^3 of $0.0187\text{ mol dm}^{-3}$ potassium manganate(VII) solution.

Write an equation for the reaction between acidified potassium manganate(VII) solution and hydrogen peroxide.

Use this equation and the results given to calculate a value for the concentration, in mol dm^{-3} , of the original hydrogen peroxide solution.

(If you have been unable to write an equation for this reaction you may assume that 3 mol of KMnO_4 react with 7 mol of H_2O_2 . This is **not** the correct reacting ratio.)

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(Extra space) (5 marks)

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END OF QUESTIONS

