

Name of the Student: _____

Max. Marks : 25 Marks

Time : 25 Minutes

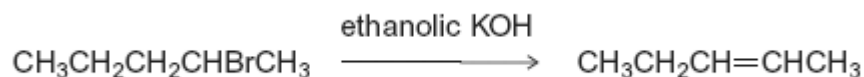
Q1.

Organic reaction mechanisms help chemists to understand how the reactions of organic compounds occur.

The following conversions illustrate a number of different types of reaction mechanism.

(a) When 2-bromopentane reacts with ethanolic KOH, two structurally isomeric alkenes are formed.

(i) Name and outline a mechanism for the conversion of 2-bromopentane into pent-2-ene as shown below.

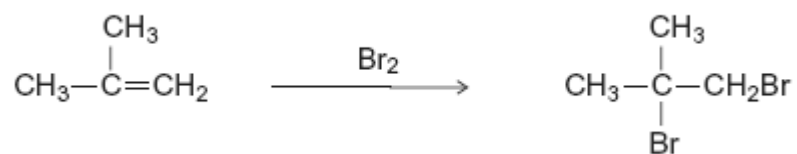


(4)

(ii) Draw the structure of the other structurally isomeric alkene produced when 2-bromopentane reacts with ethanolic KOH.

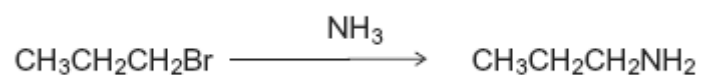
(1)

(b) Name and outline a mechanism for the following conversion.



(5)

(c) Name and outline a mechanism for the following conversion.



(5)

(Total 15 marks)

Q2.

Copper(II) sulfate solution, together with copper(II) carbonate (CuCO_3) powder, can be used to determine the identity of three solutions **A**, **B** and **C**. The three solutions are known to be hydrochloric acid, barium chloride, and sodium chloride.

In **Experiment 1** a small amount of copper(II) carbonate powder was added to each of the three solutions.

In **Experiment 2** a dropping pipette was used to add 2 cm^3 of copper(II) sulfate solution to each of the three solutions.

The results of these experiments are shown in the table below.

	Experiment 1 Addition of copper(II) carbonate powder	Experiment 2 Addition of copper(II) sulfate solution
Solution A	no visible change	white precipitate
Solution B	no visible change	no visible change
Solution C	effervescence (bubbles of gas)	no visible change

- (a) Use the observations in the table to deduce which of the solutions, **A**, **B** or **C** is hydrochloric acid _____
barium chloride _____
(2)
- (b) Explain why a precipitate was formed when copper(II) sulfate solution was added to solution **A**.
Write an equation for the reaction that occurred.
Explanation _____

Equation _____
(2)
- (c) Suggest the identity for the colourless gas produced when copper(II) carbonate powder was added to solution **C**.

(1)
- (d) Identify the two reagents that could be used in a test to confirm that the solutions contained chloride ions, **not** bromide ions. State what would be observed on addition of each reagent.
Reagent 1 _____

Observation 1 _____

Reagent 2 _____

Observation 2 _____

(4)

- (e) Copper(II) sulfate is toxic. Suggest **one** safety precaution you would take to minimise this hazard when wiping up a spillage of copper(II) sulfate solution.

(1)

(Total 10 marks)