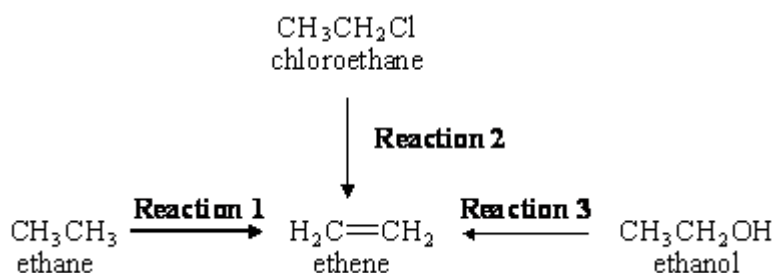


Max. Marks : 25 Marks

Time : 25 Minutes

Ethene is an important starting point for the manufacture of plastics and pharmaceutical chemicals. Most of the ethene used by industry is produced by the thermal cracking of ethane obtained from North Sea gas (**Reaction 1**). It is also possible to make ethene either from chloroethane (**Reaction 2**) or from ethanol (**Reaction 3**).



- (a) Give essential conditions and reagents for each of **Reactions 2** and **3**.

[illegible]

(4)

- (b) Name and outline a mechanism for **Reaction 2**. Suggest a reason why chloroethane is **not** chosen by industry as a starting material to make ethene commercially.

(5)

- (c) Name and outline a mechanism for **Reaction 3**. Suggest why this route to ethene may become used more commonly in the future as supplies of North Sea gas begin to run out.

(6)

(Total 15 marks)

Q2.

- (a) In the manufacture of margarine, unsaturated vegetable oils such as sunflower oil are hardened.

- (i) State the reagent and conditions used in this process.

Reagent _____

Conditions _____

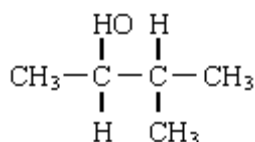
- (ii) Soft and hard margarines are obtained from the same vegetable oil. How does the structure and the melting point of a soft margarine differ from that of a hard one?

Difference in structure _____

Difference in melting point _____

(5)

- (b) In the presence of reagent X, the alcohol shown below undergoes a reaction to form two isomeric alkenes.



- (i) Name this alcohol.

- (ii) Give the name of the type of reaction involved in the formation of the two alkenes.

- (iii) Suggest the identity of reagent X.

- (iv) Give the structural formulae of the two isomeric alkenes.

Alkene 1

Alkene 2

(5)

(Total 10 marks)