Question 22 (6 marks)

A student prepared the compound methyl propanoate in a school laboratory.

(a) Give a common use for the class of compounds to which methyl propanoate belongs.

Esters such as methyl propanoate are used in perfumes.

(b) In the preparation of this compound a few drops of concentrated sulfuric acid were added to the starting materials. The mixture was then refluxed for a period of time.

Why was it necessary to reflux the mixture?

Reflux occurred because of the use of volatile reactants in esterification. As the reagents form a vapour readily, refluxing forces the vapour back into the reaction mixture to allow heating to continue for a long time.

(c) Name the TWO reactants used in preparing the methyl propanoate and draw their structural formulae.

Propanoic acid

\[ \text{CH}_3 - 
\text{CH}_2 - \text{C} = \overset{\text{O}}{\text{O}} - \text{H} \]

Methanol

\[ \text{i} \text{H} \text{H} \text{H} \text{H} \text{H} \text{H} \text{H} \text{H} \]

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