

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. 1

- Esters (perfumes, fragrances, flavourings)

- (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. 2

Why was it necessary to reflux the mixture?

- So that the volatile substances are in a closed off and safe environment allowing for no problems.

- This is a closed system, causing flammable products or substances, equipment etc, to remain unflammable.

- (c) Name the TWO reactants used in preparing the methyl propanoate and draw their structural formulae. 3

- Alkanol + Alkanoic acid → Alkyl Alkanoate + water

- Methanol + Propanoic acid → Methyl propanoate + water

- $\text{CH}_3\text{OH} + \text{C}_2\text{H}_5\text{COOH} \rightarrow \text{C}_3\text{H}_7\text{O}_2 + \text{H}_2\text{O}$

- The two reactants are Methanol & propanoic acid forming the ester (Methyl propanoate) + water.

