

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

Food flavouring (an ester)

- (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?

Refluxing was necessary to obtain any volatile liquids that would otherwise be lost. It is not too slow when sulfuric acid, a catalyst, is used.

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

methanol and propanoic acid

$$\begin{array}{c}
 \text{H} \\
 | \\
 \text{H} - \text{C} - \text{H} \\
 | \\
 \text{H}
 \end{array}
 \quad
 \begin{array}{c}
 \text{H} \quad \text{H} \quad \text{O} \\
 | \quad | \quad || \\
 \text{H} - \text{C} - \text{C} - \text{C} - \text{OH} \\
 | \quad | \\
 \text{H} \quad \text{H}
 \end{array}$$