

**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 .....

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