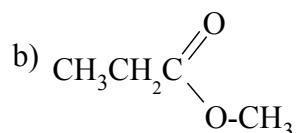
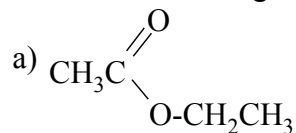


## Chemguide – questions

### ALCOHOLS: ESTERIFICATION

1. Name the following esters:



2. Draw the structures for the following esters, using a format like that in Q1 parts (a) and (b).

a) methyl ethanoate

b) propyl methanoate

c) ethyl propanoate

d) the ester (used as a banana flavour) formed by reacting 3-methylbutan-1-ol and ethanoic acid

3. a) You could make enough of the ester in Q2 part (d) to smell by warming a mixture of 3-methylbutan-1-ol and ethanoic acid with a small amount of concentrated sulphuric acid in a test tube for a few minutes and then pouring the contents into some water in a beaker before you smell it. What is the point of pouring the mixture into water?

b) Write the equation for the reaction between ethanol and ethanoic acid in the presence of concentrated sulphuric acid as a catalyst.

c) If you have answered part (b) properly, you will have shown it as a reversible reaction. If you were trying to make some ethyl ethanoate, how would you get over the fact that the reaction is reversible in order to get a good yield of the ester? Explain why your method works.

Unless you are reasonably confident about your answers so far, ignore the question on the next page which is about esterification using acyl chlorides. Worry about this when the topic comes up later in your course.

## Chemguide – questions

4. Esters can be also be made by reacting alcohols with acyl chlorides such as ethanoyl chloride,  $\text{CH}_3\text{COCl}$ .
- Suggest a disadvantage of making, say, ethyl ethanoate using this reaction.
  - What advantage(s) does the method have over the reaction between ethanol and ethanoic acid?
  - Write the equation for the reaction between ethanoyl chloride and propan-1-ol.

I am not asking much about esterification involving acyl chlorides or acid anhydrides to avoid confusing students early in an organic chemistry course. If you are faced with too much new information at once, you aren't likely to cope with it very well. These reactions are much better dealt with when you learn about these compounds later in your course.