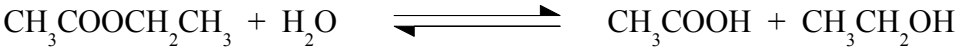
ESTERS: HYDROLYSIS

1. The equation below shows the acid hydrolysis of the ester ethyl ethanoate using an excess of dilute hydrochloric (or sulphuric) acid.



a) The reaction doesn't seem to include the hydrochloric or sulphuric acid. Why not?

b) Why is an excess of the acid used?

c) Write the formulae for the products if you hydrolysed methyl propanoate in the same way.

2. Esters are more usually hydrolysed by alkaline hydrolysis using sodium hydroxide solution.

a) Write the equation for the hydrolysis of methyl ethanoate using sodium hydroxide solution.

b) Briefly, how would you treat the reaction mixture in order to get a sample of each of the alcohol and the carboxylic acid.

3. Animal fats are esters derived from long chain acids like octadecanoic (stearic) acid, $CH_3(CH_2)_{16}COOH$, and the alcohol propane-1,2,3-triol (commonly called glycerol).

a) Draw the structure for the fat glyceryl tristearate. (You don't need to show detailed structure around the ester links.)

b) This can be converted into soap by heating with a concentrated solution of sodium hydroxide. Write the equation for this reaction.

c) Which of the products of this reaction can be used as a soap?