

Combinatorial Chemistry: Questions

1. Esters are compounds made by reacting a carboxylic acid with an alcohol.
- a) What other small molecule is produced when an alcohol and a carboxylic acid react?
_____ [1]
- b) If the alcohol has the formula ROH and the carboxylic acid the formula R'COOH, write an equation for the formation of the ester.
_____ [2]
- c) Draw the displayed structural formula (showing every atom and every bond) of the ester. Treat the groups R and R' as single atoms.
_____ [2]
- d) Give the name of the ester formed from propanoic acid and ethanol.
_____ [1]
- e) The reaction of a carboxylic acid with an alcohol is reversible so that an equilibrium mixture is formed. What will this mixture contain?
_____ [2]
- f) Esters are usually made using a strong acid catalyst. What effect will the use (or not) of a catalyst have on the composition of the equilibrium mixture?
_____ [1]
- g) One of the advantages of combinatorial chemistry is that high concentrations of reagents can be used. What effect will this have on the yield of the ester?
_____ [1]
- h) Once a set of 96 compounds has been made, each ester is examined by a number of instrumental techniques which might include infra-red spectroscopy. What peak would be present in the infra-red spectrum of the carboxylic acid and the alcohol that would not be present in the spectrum of the ester? _____ [1]