AS level Chemistry A

H032/02 Depth in chemistry

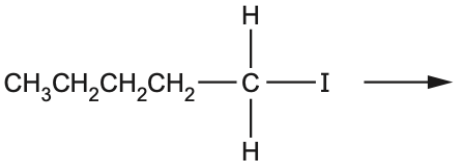
Question Set 16

1. This question is about 1-iodopentane, $CH_3CH_2CH_2CH_2CH_2I$.

(a) 1-Iodopentane can be hydrolysed by aqueous sodium hydroxide.

(i) Outline the mechanism for this reaction.

Include curly arrows, relevant dipoles and the final product(s).



[3]

(ii) 1-Iodopentane can also be hydrolysed by water using aqueous silver nitrate, with ethanol as the solvent.

A student uses this method to compare the rates of hydrolysis of 1-iodopentane and 1-bromopentane.

What measurement and observation would allow the student to compare the rates of hydrolysis?

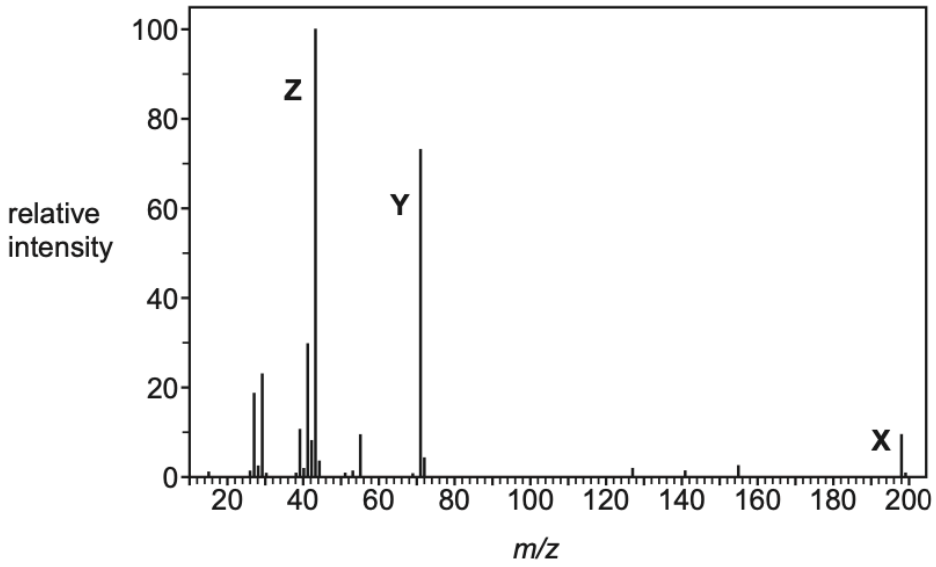
[1]

(iii) 1-Iodopentane was found to react faster than 1-bromopentane.

Explain why.

[2]

(b) The mass spectrum of 1-iodopentane is shown below.



(i) What information is given by the peak labelled **X** (*m*/*z* = 198)?

[1]

(ii) Write the structural formulae of the ions responsible for the peaks labelled **Y** and **Z**.

Y (*m*/*z* = 71) .....

Z (*m*/*z* = 43) .....

[2]

2-Iodo-2-methylbutane is an isomer of 1-iodopentane.

(c) **(i)** Draw the structure of 2-iodo-2-methylbutane.

[1]

(ii) Suggest **one** similarity and **one** difference between the mass spectra of 1-iodopentane and 2-iodo-2-methylbutane.

[2]

Total Marks for Question Set 3: 12