

## **AS level Chemistry A**

**H032/02** Depth in chemistry

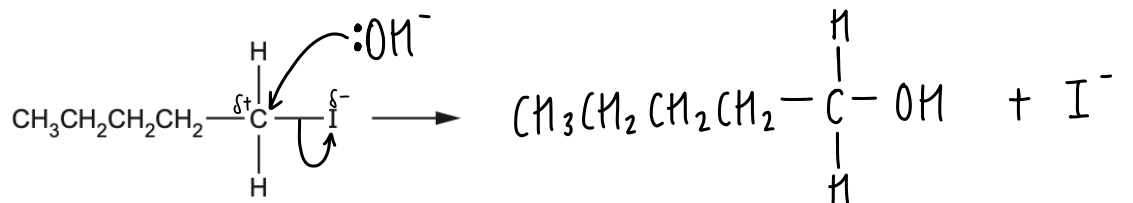
### **Question Set 16**

1. This question is about 1-iodopentane,  $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{I}$ .

(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? rate of formation of precipitate

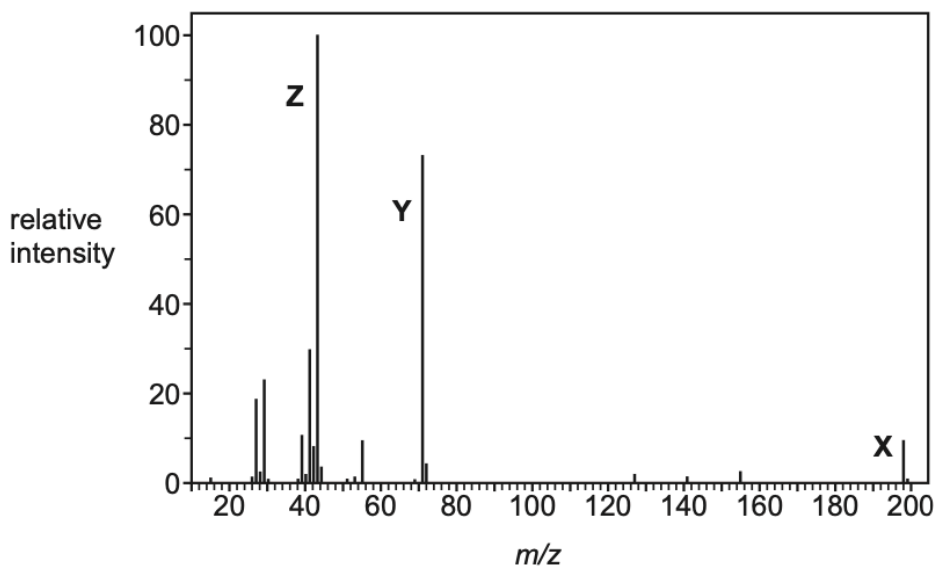
[1]

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

Explain why. iodine has a larger atomic radius than bromine so there is a weaker electrostatic attraction between C and I than C and Br and a lower bond enthalpy.

[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]

Mr of the molecule

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

Y ( $m/z = 71$ ) .....  $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_2^+$ .....

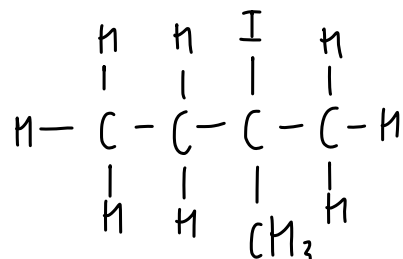
Z ( $m/z = 43$ ) .....  $\text{CH}_3\text{CH}_2\text{CH}_2^+$ .....

[2]

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

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

[1]



[2]

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

same molecular ion peak at  $m/z$  198

different number and intensity of peaks in mass spectrum

**Total Marks for Question Set 3: 12**

---

# OCR

Oxford Cambridge and RSA

## **Copyright Information**

OCR is committed to seeking permission to reproduce all third-party content that it uses in its assessment materials. OCR has attempted to identify and contact all copyright holders whose work is used in this paper. To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced in the OCR Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download from our public website ([www.ocr.org.uk](http://www.ocr.org.uk)) after the live examination series.

If OCR has unwittingly failed to correctly acknowledge or clear any third-party content in this assessment material, OCR will be happy to correct its mistake at the earliest possible opportunity.

For queries or further information please contact The OCR Copyright Team, The Triangle Building, Shaftesbury Road, Cambridge CB2 8EA.

OCR is part of the Cambridge Assessment Group; Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge