Organic analysis – AS 2022 Chemistry P2

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A student has samples of these four compounds but does not know which is which:

- butanoic acid
- 2-methylpropanal
- 2-methylpropanoic acid
- 2-methylpropan-1-ol
- Step 1: Two of these compounds can be identified by simple chemical tests.
- Step 2: The other two compounds, that contain the same functional group as each other, can then be distinguished using a spectroscopic technique.

Describe how these two steps could be used to identify which compound is	which. [6 marks]

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2. June/2022/Paper_7404/2/No.5

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This question is about the synthesis of propylamine ($CH_3CH_2CH_2NH_2$) by the reaction of 1-iodopropane ($CH_3CH_2CH_2I$) with an excess of ammonia.

 $\mathsf{CH_3CH_2CH_2I} \; + \; 2\,\mathsf{NH_3} \; \rightarrow \; \; \mathsf{CH_3CH_2CH_2NH_2} \; + \; \mathsf{NH_4I}$

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Name and outline the mechanism for this reaction.

[5 marks]

Name of mechanism

Outline of mechanism

0 5 . 2	1-iodopropane is a liquid at room temperature.	
	Calculate the number of molecules in 5.0 cm ³ of 1-iodopropane (M_r = 169.9). Give your answer in standard form.	
	For 1-iodopropane, density = 1.75 g cm ⁻³	
	The Avogadro constant, $L = 6.022 \times 10^{23} \text{ mol}^{-1}$ [2 mag)	arks]
	Number of molecules	
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3. June/2022/Paper_7404/2/No.13

	Which compound has t	he highest boiling point?	[1 mark]
	A CH₃COCH₂CH₃	0	
	B CH ₃ CH ₂ CH ₂ CH ₂ OH		
	C CH ₃ CH ₂ CH ₂ CHO		
	D CH ₃ CH ₂ CH ₂ CH ₂ CH ₃ CH ₃		
	5 5113511251125113		
4.	June/2022/Paper_7404/2/No.1 Which reaction does no	6 ot result in a change in the shape are	ound a carbon atom? [1 mark]
	A chloromethane with	aqueous sodium hydroxide	0
	B ethene with bromine		0
	C propane with excess	oxygen	0
	D propan-1-ol with acid	dified potassium dichromate(VI)	0
5.	June/2022/Paper_7404/2/No.2 When 2-bromobutane is elimination reactions bo	s warmed with potassium hydroxide	solution, substitution and
	Which of these compou	inds is not produced?	[1 mark]
	A butan-1-ol	0	
	B butan-2-ol	0	
	C but-1-ene	0	
	D E-but-2-ene	0	

6.	June/2022/Paper	7404/2/No.22
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What is the role of the hydroxide ions in the elimination reaction?

[1 mark]

A base

B catalyst

C electrophile

D nucleophile