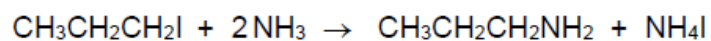


2. June/2022/Paper_7404/2/No.5

0 5

This question is about the synthesis of propylamine ($\text{CH}_3\text{CH}_2\text{CH}_2\text{NH}_2$) by the reaction of 1-iodopropane ($\text{CH}_3\text{CH}_2\text{CH}_2\text{I}$) with an excess of ammonia.



0 5 . 1

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 marks]

Number of molecules _____

0 5 . 3 In an experiment, 10.3 g of 1-iodopropane ($M_r = 169.9$) are reacted with an excess of ammonia. 2.3 g of propylamine ($M_r = 59.0$) are produced.

Calculate the percentage yield in this experiment.

[2 marks]

Percentage yield _____

3. June/2022/Paper_7404/2/No.13

Which compound has the highest boiling point?

[1 mark]

A $\text{CH}_3\text{COCH}_2\text{CH}_3$

B $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{OH}$

C $\text{CH}_3\text{CH}_2\text{CH}_2\text{CHO}$

D $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}_3$

4. June/2022/Paper_7404/2/No.16

Which reaction does **not** result in a change in the shape around a carbon atom?

[1 mark]

A chloromethane with aqueous sodium hydroxide

B ethene with bromine

C propane with excess oxygen

D propan-1-ol with acidified potassium dichromate(VI)

5. June/2022/Paper_7404/2/No.21

When 2-bromobutane is warmed with potassium hydroxide solution, substitution and elimination reactions both occur.

Which of these compounds is **not** produced?

[1 mark]

A butan-1-ol

B butan-2-ol

C but-1-ene

D *E*-but-2-ene

6. June/2022/Paper_7404/2/No.22

What is the role of the hydroxide ions in the elimination reaction?

[1 mark]

A base

B catalyst

C electrophile

D nucleophile