

Solutions

Each answer shows the steps, then the **result**.

2.1

- potassium cyanide (KCN) in ethanol; and heat

2.2

- a carboxylic acid ($-\text{COOH}$)

3.1 B

- KCN adds one carbon to the chain (forming the nitrile)

3.2 B

- Hydrolysis of a nitrile gives the carboxylic acid (ethanoic acid)

3.3

(a)

- $\text{C}_2\text{H}_5\text{Br} + \text{KCN} \rightarrow \text{C}_2\text{H}_5\text{CN} + \text{KBr}$

(b)

- warm the nitrile with dilute acid (or dilute alkali then acidify); the $-\text{CN}$ group is hydrolysed to $-\text{COOH}$

3.4

- HCN with a KCN catalyst (and heat); nucleophilic addition