Homework- Amines

1. Which type of compound **cannot** be a monomer in the formation of polyamides?

   A. amides

   B. amino acids

   C. diacyl chlorides

   D. diamines

2. **Fig. 2.1** shows a reaction sequence to form an amine.

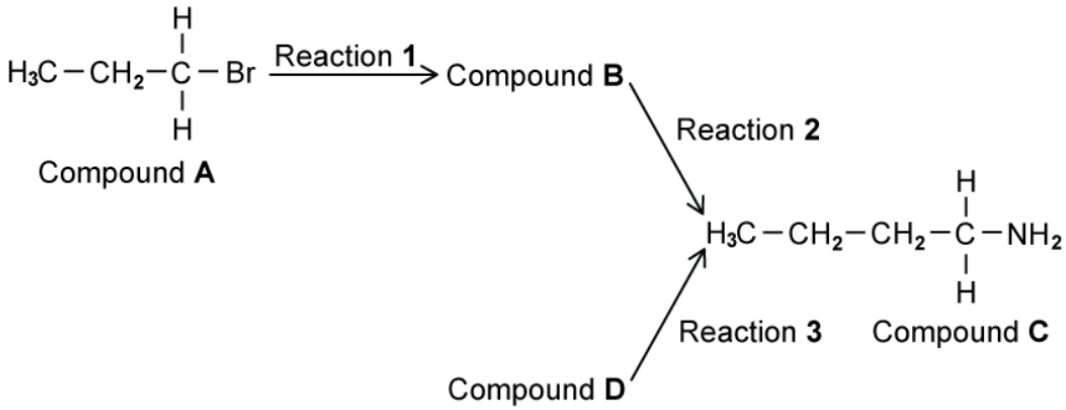


Fig. 2.1

i) Name compound **A**.

ii) Reaction **1** heats compound **A** under reflux with an ethanolic solution of potassium cyanide.

Draw the mechanism for the reaction of compound **A** with the ethanolic solution of potassium cyanide to form compound **B**.

- Identify the ion that reacts with compound **A**
- Draw the product of this reaction, compound **B**.
- Include all charges, partial charges, lone pairs and curly arrows.

3. Propylamine can be produced from 1–bromopropane.

Complete the equation for the formation of propylamine.

$$CH_3CH_2CH_2Br + \ldots\ldots\ldots\ldots \rightarrow \ldots\ldots\ldots\ldots + HBr$$

4. 1–chloropropane can be used to make propylamine.

Which row shows the correct reagents and type of reaction?

	Reagents	**Type of reaction**
A	Aqueous ammonia	Electrophilic addition
B	Aqueous ammonia	Nucleophilic substitution
C	Ethanolic ammonia	Nucleophilic substitution
D	Ethanolic ammonia	Electrophilic addition

5. Propylamine is a colourless liquid that is used to manufacture a variety of chemicals including textile resins, drugs and pesticides. It can be produced by the reaction of 1-chloropropane with ammonia.

$$CH_3 — CH_2 — CH_2 — Cl \xrightarrow{NH_3} CH_3 — CH_2 — CH_2 — NH_2$$

i) State the role of the ammonia in this reaction.

ii) Name the type of reaction that occurs in this synthesis of propylamine.

6. Compound **X** is produced from cyclohexene. An amine which is a relatively weak base containing one nitrogen atom can be produced from compound **X** in one step.

Outline a mechanism for the formation of compound **X** from cyclohexene. You will need to give suitable reagents in your answer.

7. What type of reaction makes ethylamine from bromoethane?

A. Oxidation

B. Reduction

C. Nucleophilic substitution

D. Electrophilic substitution

8. When 1-bromoethane reacts with an equal amount of **X**. What would **X** be and what is the product of this reaction?

	X	**Product**
A	Ammonia	Amine
B	Methylamine	Amide
C	Water	Weak acid
D	Methanol	Ethyl methanoate

9. CH_3CH_2Cl reacts with an excess of ethanolic NH_3.

Which compound is the main organic product?

A. $(CH_3CH_2)_3N$

B. $(CH_3CH_2)_2NH$

C. $CH_3CH_2NH_2$

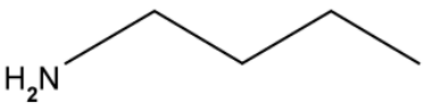
D. $(CH_3CH_2)_4N^+$

10. What is the correct set of reagents and conditions for the two reactions shown?

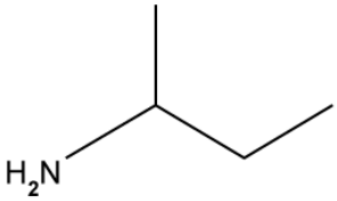
	$(CH_3)_2CO \rightarrow (CH_3)_2CHCN$	$CH_3CHClCH_3 \rightarrow CH_3CH(NH_2)CH_3$
A	Sn / conc. H_2SO_4	Dilute ethanolic NH_3
B	Sn / conc. HCl	Excess ethanolic NH_3
C	NH_3	Nitric acid / 50 °C
D	KCN, H_2SO_4	Excess ethanolic NH_3

11. Which amine could not be produced by the reduction of a nitrile?

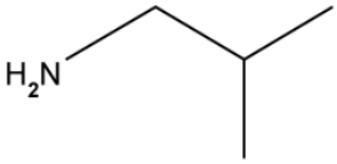
A.



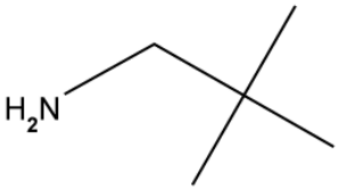
B.



C.

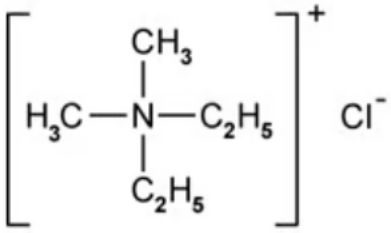


D.



12.

What is the systematic name of the amine shown?



A. Dimethyldiethyl ammonium chloride

B. Diethylmethyl ammonium chloride

C. Diethyldimethyl ammonium chloride

D. Methylethyl ammonium chloride