Amines and Polymers Map

Edexcel A Level Chemistry · Topic 18B Amines, Amides and Polymers

1 Classes and names

18B.8

- Count the **carbons on N**
- One: primary; two: secondary
- Three: tertiary; four: quaternary ion
- Propylamine or propan-1-amine



2 Preparing amines

18B.11, 18B.12

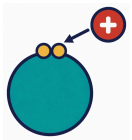
- **Excess ethanolic NH_3**, pressure
- Nitrile + **$LiAlH_4$** in dry ether
- $ArNO_2$ + **Sn, conc HCl**
- Then NaOH(aq) frees $ArNH_2$

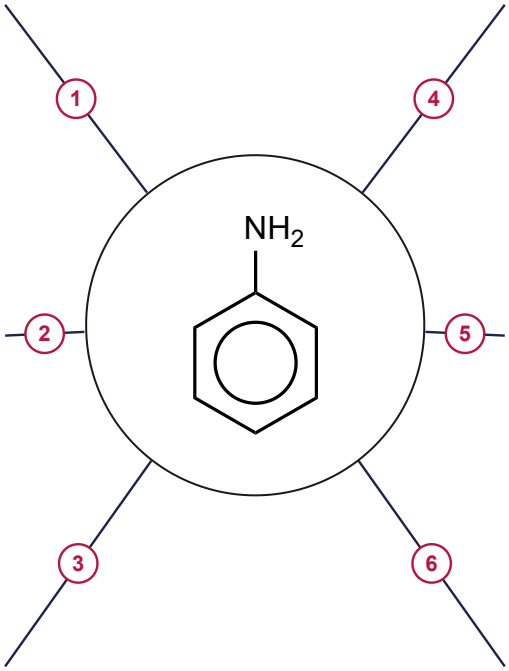


3 Bases

18B.9, 18B.10

- N lone pair accepts **H^+**
- $RNH_2 > NH_3 > C_6H_5NH_2$
- Alkyl releases electrons
- Ring **delocalises** the pair





4 Nucleophiles

18B.9

- RX: **further substitution**
- Ends at the quaternary salt R_4N^+
- CH_3COCl: N-substituted amide
- HCl meets a **second mole** of amine



5 Copper(II) ions

18B.9

- A little amine: **pale blue** solid
- $[Cu(OH)_2(H_2O)_4]$
- Excess: **deep blue** solution
- $[Cu(RNH_2)_4(H_2O)_2]^{2+}$



6 Condensation polymers

18B.14, 18B.15

- Diamine + diacid: **polyamide**
- Diol + diacid: **polyester**
- H_2O lost at each link
- Hydrogen bonds in polyamides



Reactions of amines

butylamine and phenylamine

With	Butylamine	Phenylamine
Water	Mixes: alkaline solution	Very weakly alkaline
HCl(aq)	$C_4H_9NH_3^+Cl^-$	$C_6H_5NH_3^+Cl^-$: dissolves
CH_3COCl	N-butylethanamide	Not required
Excess RX	Quaternary ammonium salt	Not required
Cu^{2+}(aq)	Deep blue with excess	Not required

Worked examples

Yield

- 12.3 g $C_6H_5NO_2$: 0.100 mol
- 7.44 g product: 0.0800 mol
- **80%**

Titration

- 0.0100 mol amine
- 25.0 cm^3 of HCl, 1 : 1
- **0.400 mol dm^{-3}**

Chain length

- Target butylamine
- From 1-bromopropane
- **KCN, then $LiAlH_4$**

Online Learning System · onlinelearningsystem.net · © 2026 Online Learning System. All rights reserved. Not for redistribution.