

# Cambridge (CIE) A Level Chemistry



Your notes

## Primary Amines

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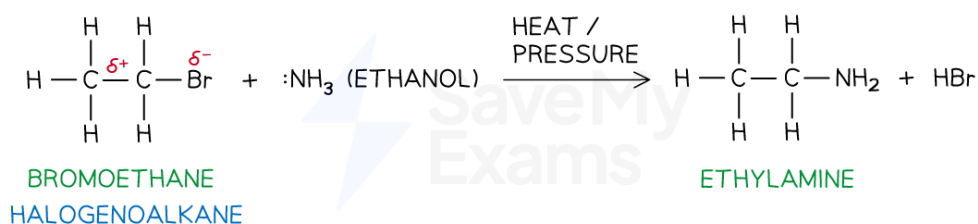
\* Making Amines



# Production of Amines

- **Amines** are compounds with the amine ( $\text{-NH}_2$ ) functional group
- They can be produced as a result of **nucleophilic substitution** reactions of halogenoalkanes when they are heated under pressure with ethanolic ammonia ( $\text{NH}_3$  in ethanol)
- The halogen atom in halogenoalkanes is **more electronegative** than the carbon atom it is bonded to
- The halogen, therefore, draws **electron density** from the C-X bond (where X is the halogen) towards itself
- The carbon, therefore, has a **partial positive charge** and the halogen itself has a **partial negative charge**
- The lone pair of electrons on the nitrogen atom (in  $\text{NH}_3$ ) acts as a **nucleophile** and attacks the partial positively charged carbon
- As a result of this nucleophilic attack, the C-X bond is broken and the halogen is substituted by an amine group

## Example nucleophilic substitution of a halogenoalkane



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**Ammonia or amines replace the halogen in halogenoalkanes in a nucleophilic substitution reaction**