



Organic Chemistry Revision Sheets

Benzene | Electrophilic Substitution, Friedel-Crafts (Alkylation)

Reaction

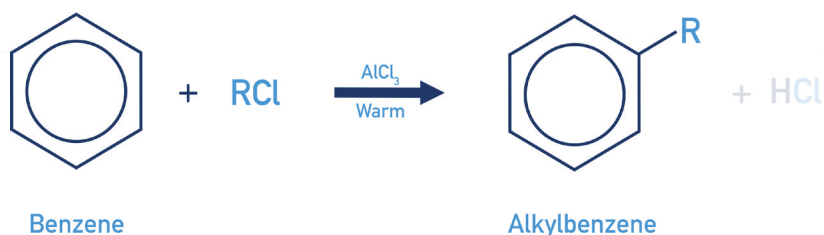
REACTANTS: Benzene and Halogenoalkane

CONDITIONS: Warm and AlCl_3 catalyst

PRODUCT: Alkylbenzene

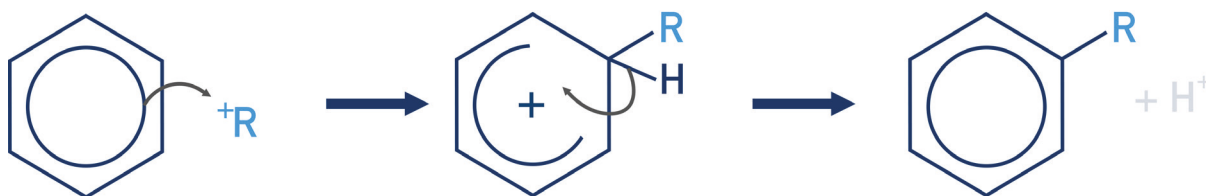
REACTION TYPE: Electrophilic Substitution, *Alkylation*

REACTION:
(example of
benzene)



Mechanism

Alkyl (R^+) ion **acts as an electrophile due to its carbocation accepting an electron pair** from the delocalised ring of electrons in the benzene ring. Carbon-carbon bond forms. Carbon-hydrogen bond breaks to give electron pair back to delocalised ring of electrons. R^+ ion replaces H on benzene ring. **Substitution reaction.**



Notes:

- Alkyl (R^+) ion is formed by reacting a halogenoalkane with a halogen carrier (AlCl_3)



- H^+ ion removed from benzene ring combines with $[\text{AlCl}_4]^-$ to reform AlCl_3 catalyst and HCl is formed

