



Organic Chemistry Revision Sheets

Benzene | Electrophilic Substitution (Halogenation, with Br₂)

Reaction

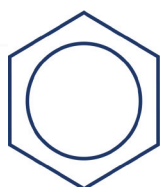
REACTANTS: Benzene and Halogen

CONDITIONS: Halogen carrier (AlCl₃, AlBr₃ or Fe)

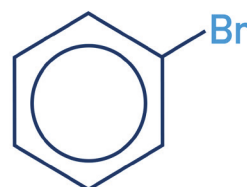
PRODUCT: Halogenated Arene (chloro-benzene, bromo-benzene)

REACTION TYPE: Electrophilic Substitution, *Halogenation*

REACTION:
(example of
benzene)



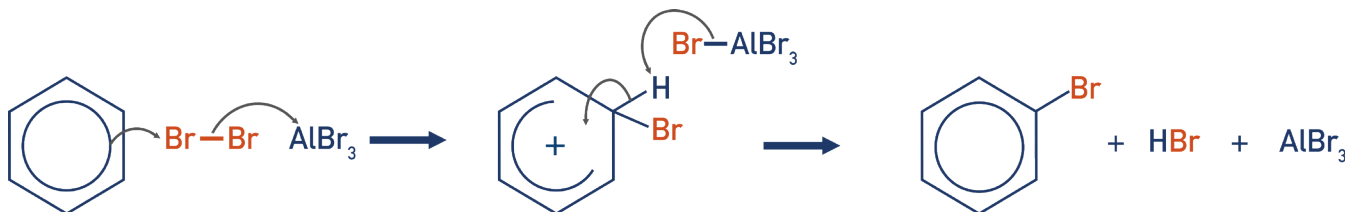
Benzene



Bromobenzene

Mechanism

Bromine molecule **acts as an electrophile** because it is **polarised sufficiently by a halogen carrier (AlBr₃)** and accepts an electron pair from the delocalised ring of electrons in the benzene ring. A carbon-bromine bond forms. The carbon-hydrogen bond breaks to give the electron pair back to the delocalised ring of electrons. Br replaces H on the benzene ring. **Substitution reaction.**



Notes:

- Benzene is unable to undergo halogenation without a halogen carrier as the delocalised electron ring is unable to polarise the halogen molecule enough to form an electrophile.
- The halogen carrier polarises the halogen molecule to the point of enabling one of the halogen atoms (now with a partial positive charge) to act as an electrophile and accept a pair of electrons from benzene.

