

Reaction

REACTANTS: Benzene and Halogen **CONDITIONS:** Halogen carrier (AICI₃, AIBr₃ or Fe) **PRODUCT:** Halogenated Arene (chloro-benzene, bromo-benzene) **REACTION TYPE:** Electrophilic Substitution, *Halogenation*



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 the give electron pair back to delocalised ring of electrons. Br replaces H on benzene ring. *Substitution reaction*.

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Notes:

- Benzene is unable to undergo halogenation without a halogen carrier as the delocalised electron ring is unable to polarilse the halogen moleucle enough to form an electrophile.
- The halogen carrier poalrises 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.



