



Organic Chemistry Revision Sheets

Halogenoalkanes | Elimination (with OH⁻)

Reaction

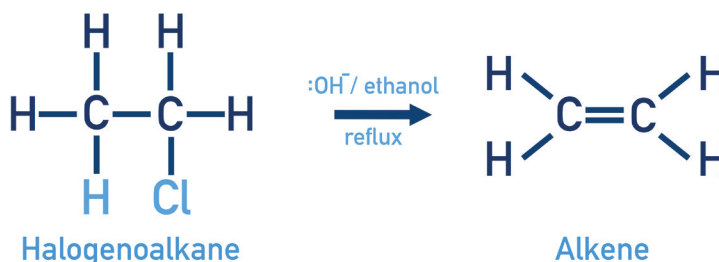
REACTANTS: Halogenoalkane and Sodium (or Potassium) Hydroxide, NaOH

CONDITIONS: Heat under reflux, Ethanolic conditions (in ethanol, no water present)

PRODUCT(S): Alkene and Halide Ion (and water)

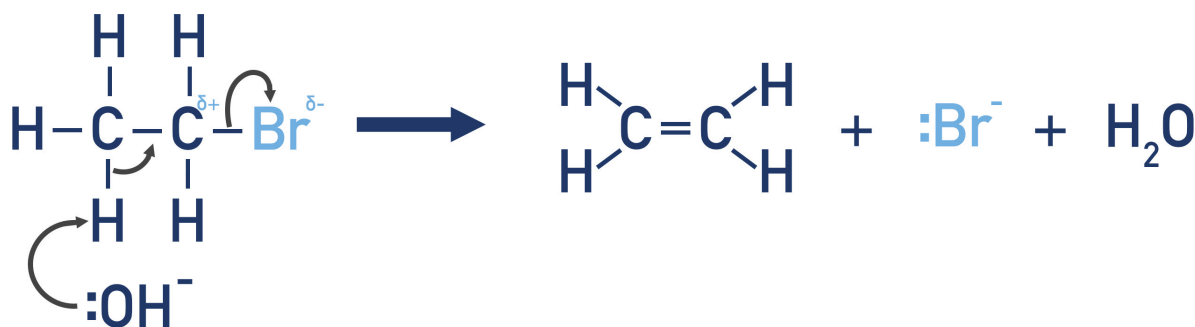
REACTION TYPE: Elimination

REACTION:
(example of
chloroethane)



Mechanism

Hydroxide ion (:OH⁻) acts as a base due to the lone pair of electrons on the oxygen atom allowing it to remove a H⁺ ion from the carbon atom next to the carbon-halogen bond. The carbon-halogen bond breaks, forming a double bond between carbon atoms. The halogen group is **eliminated** from the halogenoalkane.



Notes:

- Reaction must be carried out in **ethanolic conditions (in ethanol, no water present)**, otherwise **an alcohol is likely to form** rather than the alkene.
- Unlike in nucleophilic substitution reactions of halogenoalkanes, the **hydroxide ion is acting as a base**.
- The strength of the carbon-halogen bond (bond enthalpy) determines the speed of the reaction. The stronger the bond, the slower the nucleophilic substitution reaction. *C-F bond is strongest, giving slowest reaction; C-I bond is weakest, giving fastest reaction.*