

Synthesis : Halogenation of Alkanes

Reagent Cl₂ / Br₂

Condition heat / UV light

Mechanism free radical substitution

Equation CH₄ + Cl₂ → CH₃Cl + HCl

Synthesis : Hydrohalogenation of Alkenes

also known as Addition of hydrogen halides

Reagent HCl / HBr / HI

Equation CH₃CH₂CH=CH₂ + HCl → CH₃CH₂CHCl-CH₃

(every product must be shown)

follow Markovnikov's rule : halogen added to doubly bonded carbon atom attached to **the least H atoms**

Dehydrohalogenation

Reagent NaOH / KOH

Condition ethanol, reflux

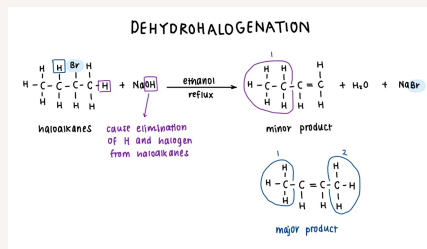
Mechanism Elimination Reaction

Equation haloalkane + NaOH → alkene

(every product must be shown)

follow Zaitsev rule : doubly bonded carbon atom in alkenes bonded to **the most number of alkyl groups** is major products

Dehydrohalogenation



Synthesis : Halogenation of Alkenes

Reagent Cl₂ / Br₂

Condition CCl₄

Equation CH₃CH=CHCH₃ + Cl₂ → CH₃CHCl-CHClCH₃

Hydrolysis

Reagent aqueous NaOH / KOH

Condition boiling

Mechanism Nucleophilic Substitution

Equation haloalkanes + NaOH → alcohol + NaCl

for carbons bonded to 2 halogens

Equation CH₃CHCl₂ + NaOH → CH₃CH(OH)₂

CH₃CH(OH)₂ → CH₃CH=O (loss of water)

Hydrolysis

