Haloalkane / Alkyl halides Cheat Sheet

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Synthesis : Halogenation of Alkanes

Reagent	Cl_2 / Br_2
Condition	heat / UV light
Mechanism	free radical substitution
Equation	$CH_4 + Cl_2 \rightarrow CH_3Cl + HCl$

Synthesis : Hydrohalogenation of Alkenes

also known as	Addition of hydrogen halides
Reagent	HCl / HBr / HI
Equation	$CH_3CH_2CH{=}CH_2 + HCl \rightarrow CH_3CH_2CHCl\text{-}CH_3$
	(every product must be shown)

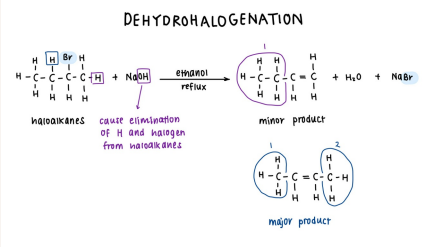
follow Markovnikov's rule : halogen added to doubly bonded carbon atom attached to **the least H atoms**

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	Cl_2 / Br_2
Condition	CCl_4
Equation	$CH_3CH{=}CHCH_3 + Cl_2 \rightarrow CH_3CHCl\text{-}CHClCH_3$

Hydrolysis

Reagent	**aqueous** NaOH / KOH
Condition	boiling
Mechanism	Nucleophilic Substitution
Equation	haloalkanes + NaOH → alcohol + NaCl
	for carbons bonded to 2 halogens
Equation	$CH_3CHCl_2 + NaOH \rightarrow CH_3CH(OH)_2$
	$CH_3CH(OH)_2 \rightarrow CH_3CH{=}O$ (loss of water)

Hydrolysis