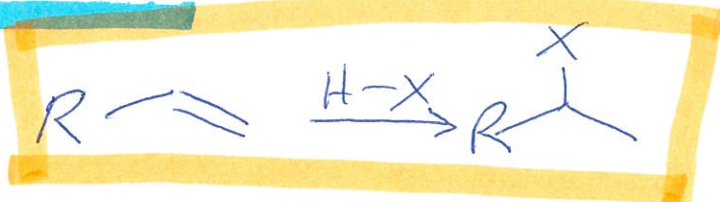
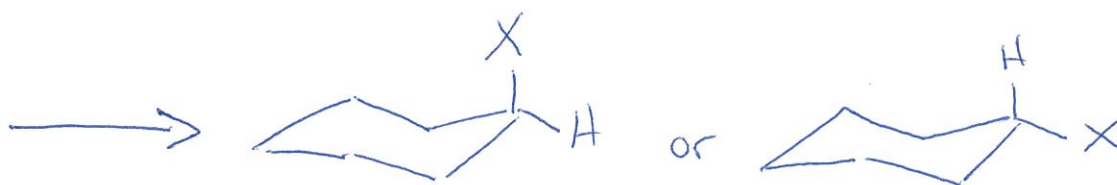
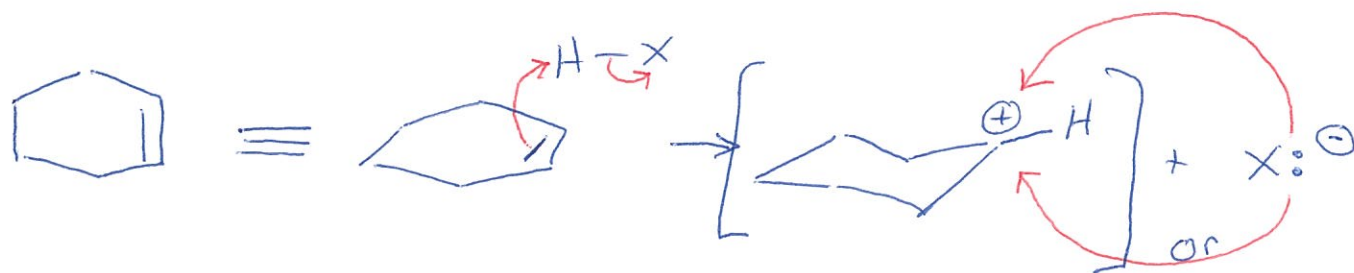
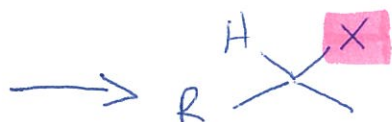
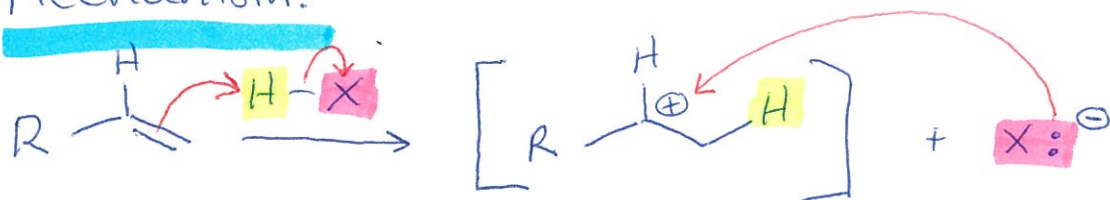


# Hydrogen Halide Addition

Alkene  $\rightarrow$  Alkyl Halide



Mechanism:

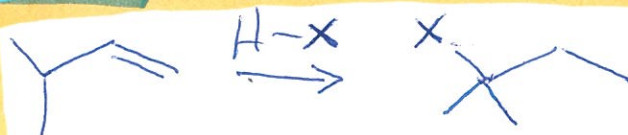


Key points: Alkene acts as nucleophile/base

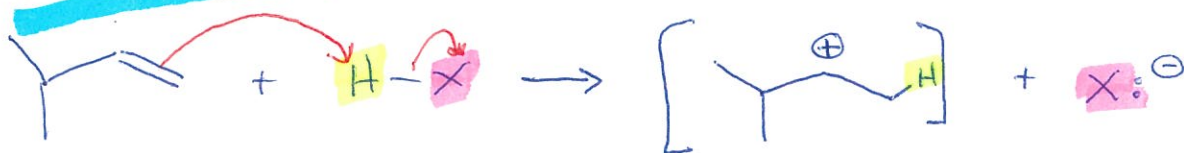
- Gives most stable carbocation
- Markovnikov addition
- Planar carbocation intermediate
- Subject to rearrangement

# Hydrogen Halide Addition with rearrangement

Alkene  $\rightarrow$  Alkyl Halide



Mechanism:



2° carbocation

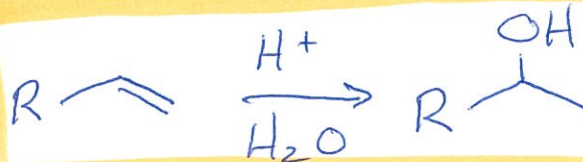


3° carbocation



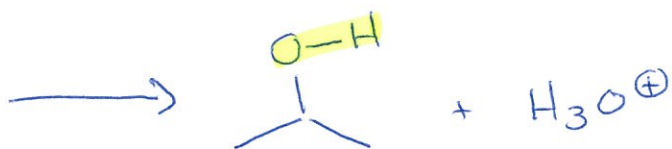
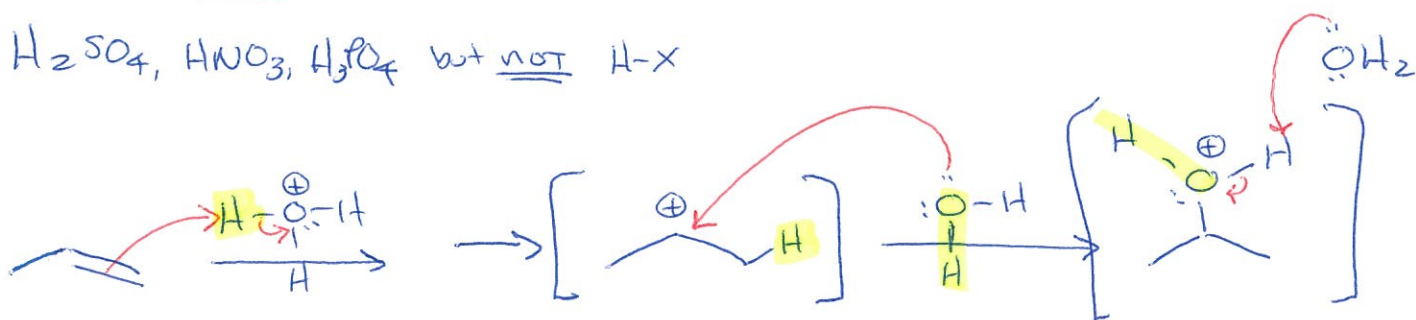
# Acid catalyzed hydration of an Alkene

Alkene  $\rightarrow$  Alcohol



Mechanism:

$\text{H}_2\text{SO}_4, \text{HNO}_3, \text{H}_3\text{PO}_4$  but NOT  $\text{H-X}$



Key points: Markovnikov addition  
Carbocation can rearrange  
Cation stability  
 $3^\circ > 2^\circ \gg 1^\circ$

Catalytic in acid

Use only acids that do not have nucleophilic conjugate bases.