<u>Chem 164/261</u> Oct 23, 2007

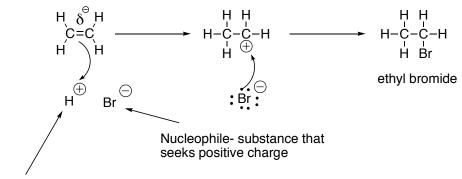
Addition reactions of alkenes

Hydrogen Halide Addition (HX)

General reaction

$$C=C$$
 + HX \longrightarrow $C-C$ - Usually syn

Eg 1.



Electrophile- substance that seeks negative charge

Eg 2.

Explanation-

- goes through single bonds

tertiary carbocation planar, sp²

Stability of Carbocations

$$3^{\circ}$$
 > 2° > 1° > ${}^{\oplus}CH_3$

R R R R
R-C-H H-C-H

Hydration and Ether formation

General Reactions

Sulfuric acid has a non-nucleophilic counter ion

Eg 1.

$$\stackrel{\delta^{\oplus}}{\nearrow} \delta^{\ominus} \qquad \stackrel{\delta^{\ominus}}{\longrightarrow} \delta^{\oplus} \qquad \stackrel{\mathsf{H}_{\mathsf{D}}\mathsf{-H}}{\longrightarrow} \qquad \stackrel{\mathsf{H}_{\mathsf{P}}\mathsf{-H}}{\longrightarrow} \qquad \stackrel{\mathsf$$

Mechanism:

Eg 3.

$$(Ethanol)$$

$$\delta \delta \delta^{\oplus}$$

$$CH_{3}CH_{2}OH$$

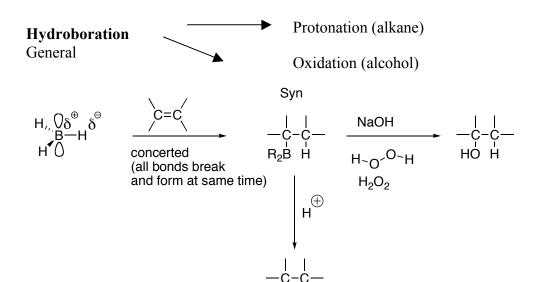
$$H_{2}SO_{4}$$

$$OCH_{2}CH_{3}$$

$$1H$$

$$2H$$

Eg 4. Intramolecular



Formally Anti-Markovnikov Addition of H-OH in opposite sense.

 B_2H_6 – diborane behaves like BH_3

Eg 1.

Eg 2.

Overall anti-Markovnikov addition of water