Demonstration

H-OH	+ Metal	 \oplus \bigcirc Metal OH +	H ₂
	К	KOH	
	Na	NaOH	

Elimination Reactions

Synthesis of Alkenes and Alkynes

General



Three examples

1. Dehalogenation



2. Dehydrohalogenation : Generally requires base e.g. R-O Na⁺



3. Dehydration/ Ether cleavage - general requires acid

R= H or Alkyl

Mechanism of Elimination – E2



Concerted – all bonds break and form at the same time ∴ reaction is stereospecific.

Bimolecular : Rate depends on 2 concentrations (brackets represent concentration).

Favoured for 1° carbon leaving group and strong base.



Mechanism of elimination - E1



Stepwise -not concerted -carbocation intermediate -not stereospecific -unimolecular -rate depends on one concentration



-favoured for 3° carbon leaving group

Dehalogenation – "Always" E2



Dehydrohalogenation

Favored geometry – Anti-periplanar

Eg. 1





Zaitsev Rule – formation of most substituted double bond favoured in elimination reactions.



Limitations

Must have H on adjacent carbon – reaction below does NOT work due to lack of H that can be removed

Eg. 2



Bicyclic Systems – require special attention



Bredt's rule – in bicyclic molecules no alkene to a brigehead carbon, if all bridges have \geq 1 carbon and small rings (< 7). In top example one bridge has 0 carbons and alkene formation works.



Elimination of H-OH or H-OR (generally requires acid eg. H₂SO₄)

Eg. 1



HO⁻ or RO⁻ are bad leaving groups however HO-H or RO-H are good leaving groups

