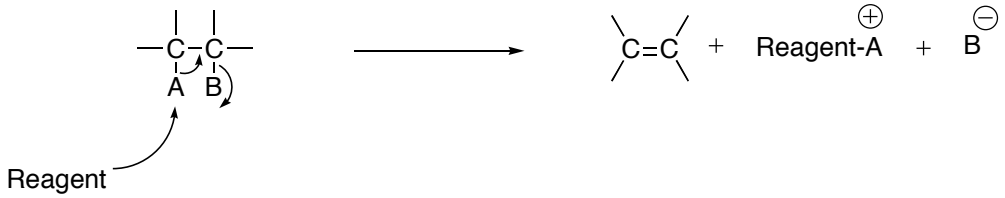
Elimination Reactions

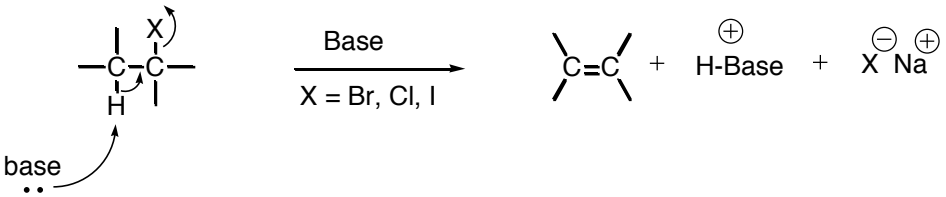
Synthesis of Alkenes and Alkynes

General

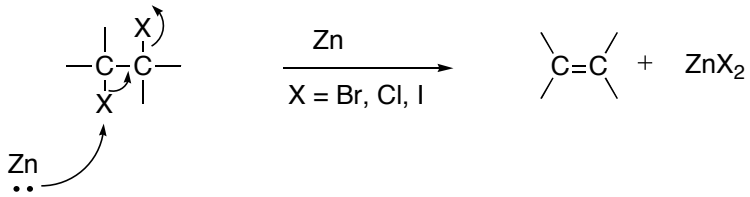


Three examples/types:

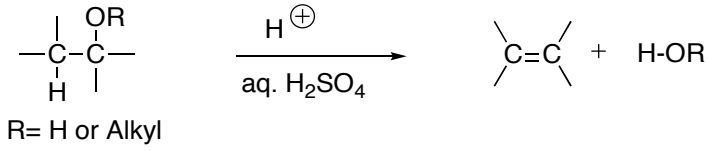
1. Dehydrohalogenation : Generally requires base e.g. $R\text{-}O^{-}\ Na^{+}$



2. Dehalogenation

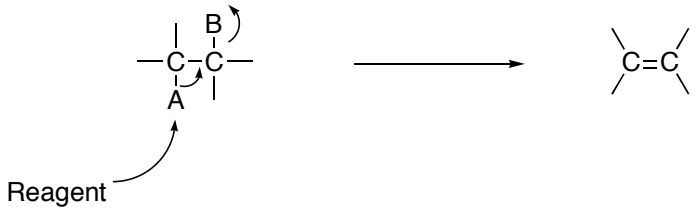


3. Dehydration/ Ether cleavage – general requires acid



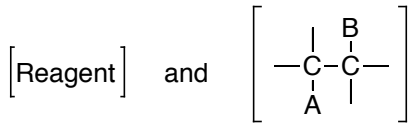
R= H or Alkyl

Mechanism of Elimination – E2



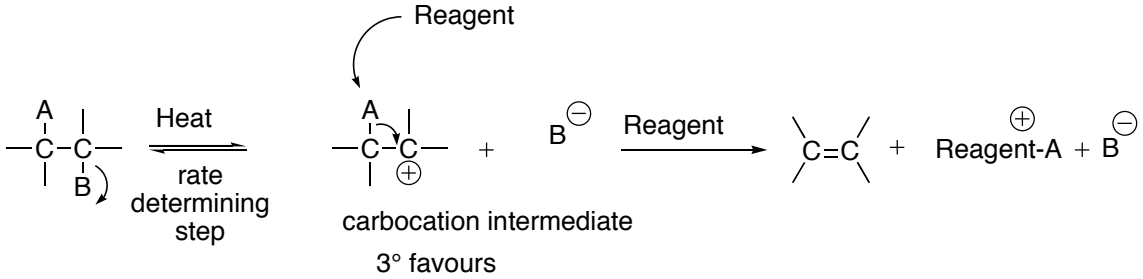
Concerted – all bonds break and form at the same time ∴ reaction is stereospecific.

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

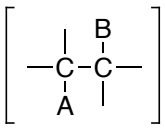


Favoured for 1° carbon leaving group and strong base.

Mechanism of elimination – E1



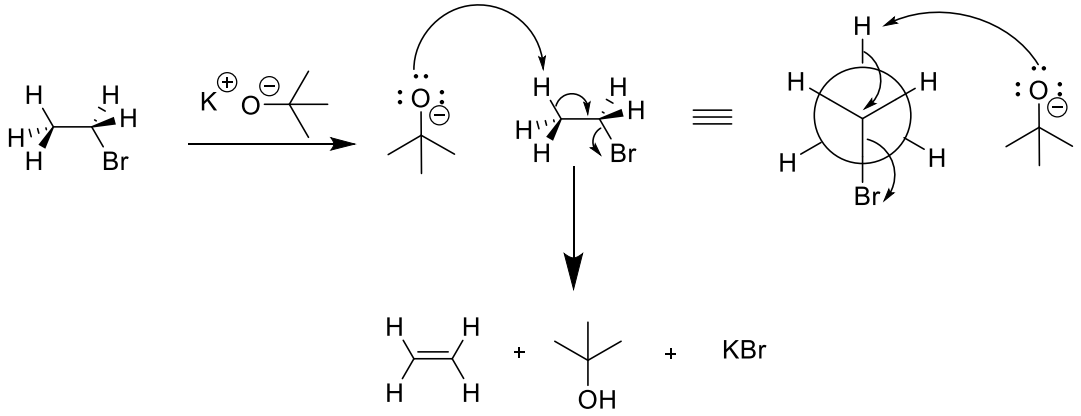
Stepwise -not concerted
-carbocation intermediate
-not stereospecific
-unimolecular
-rate depends on one concentration



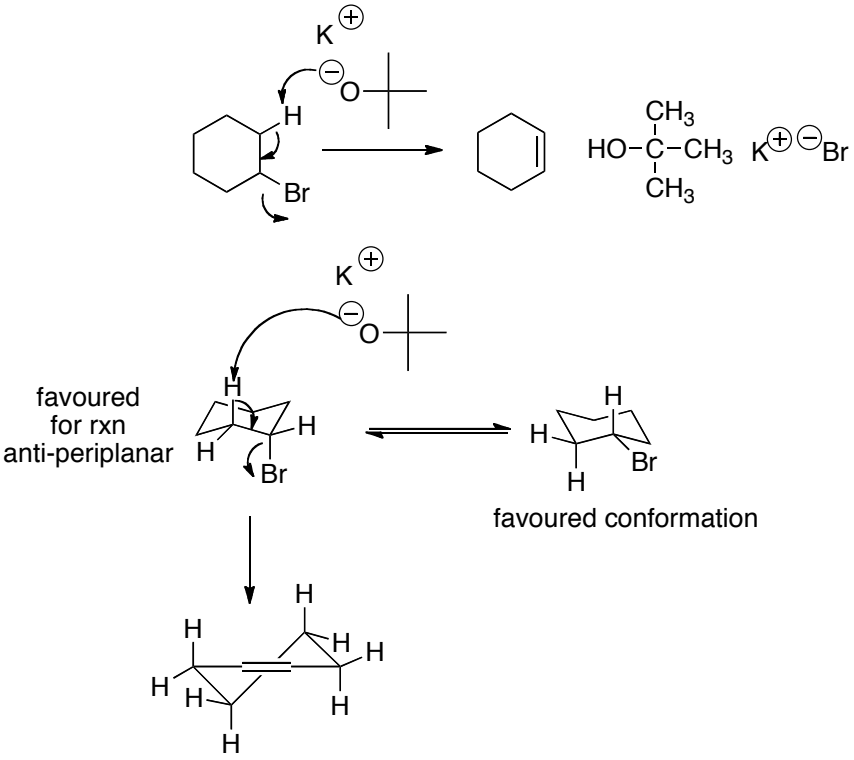
-favoured for 3° carbon leaving group

<u>Dehydrohalogenation</u>

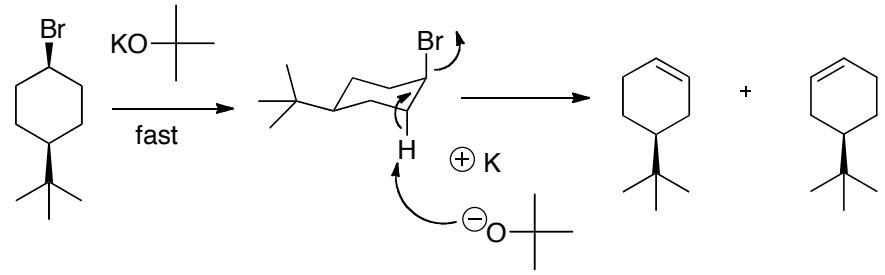
Favored geometry – Anti-periplanar

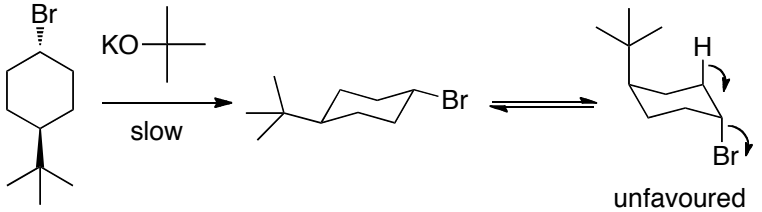


Eg. 1

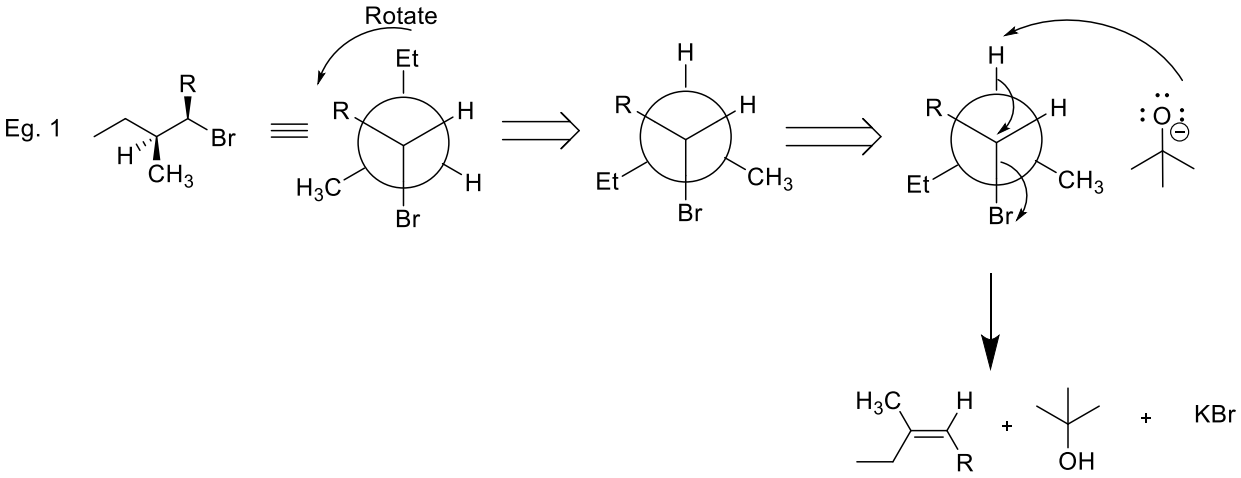


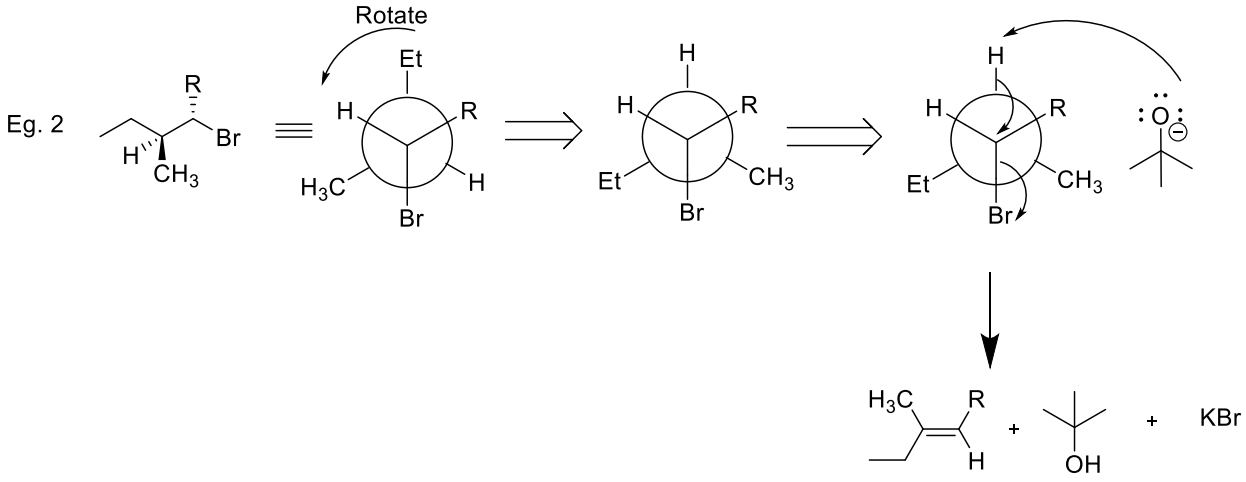
Example 2:





Stereospecificity and Eliminations:





Dehalogenation – "Always" E2