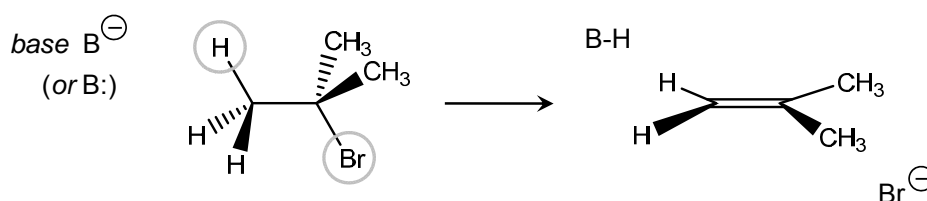


Elimination Reactions

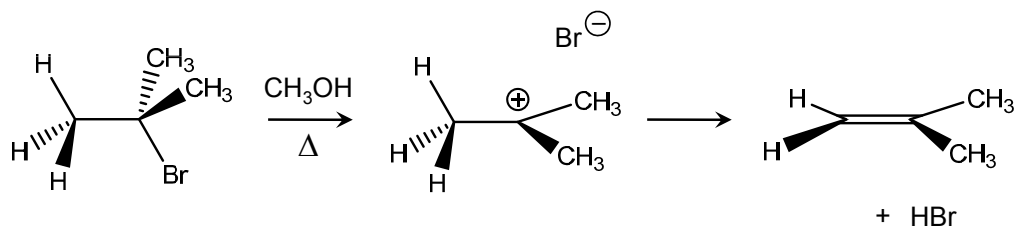
- Elimination reactions generate alkenes via the loss of a leaving group and a proton.
- The proton must be one carbon away from (α to) the leaving group.
- The new double bond stretches between the two carbons that used to bear the H and the leaving group.



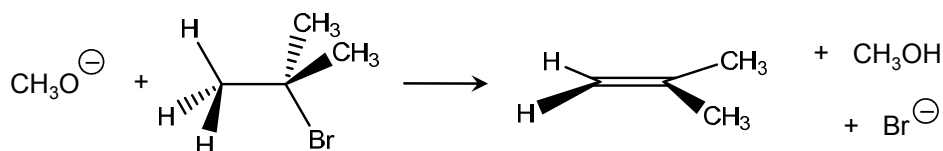
Elimination Reaction Mechanisms

- As with substitution, there are two elimination mechanisms that yield the same products.

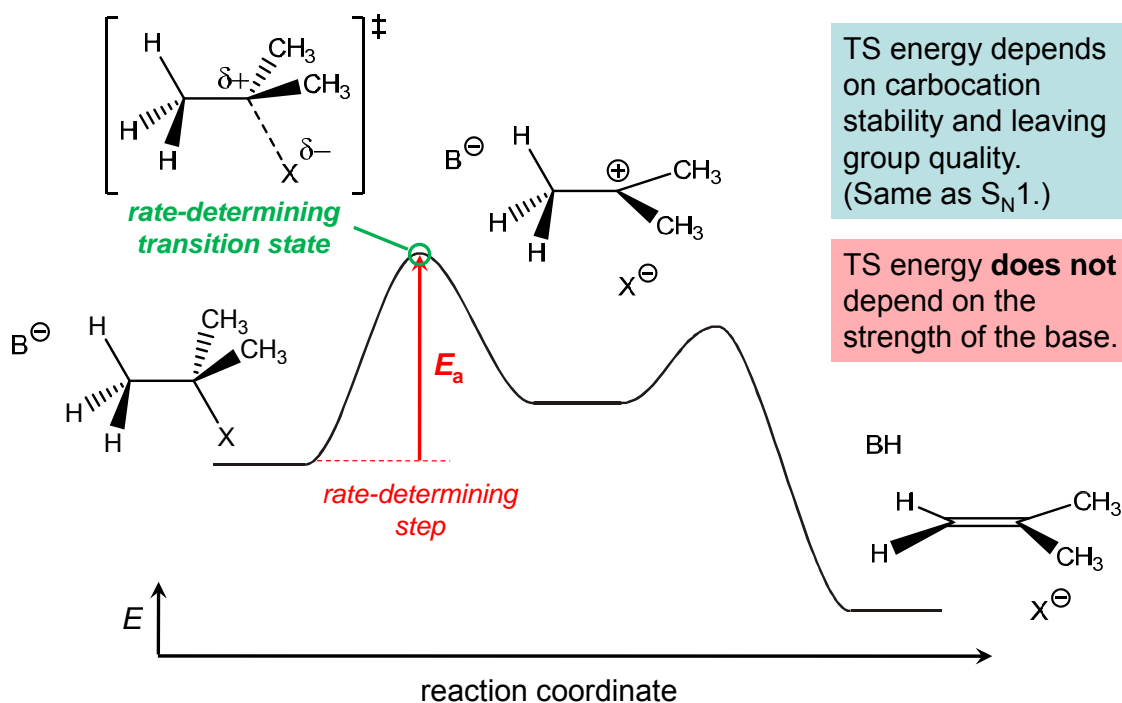
1st Order Elimination (E1) :



2nd Order Elimination (E2):

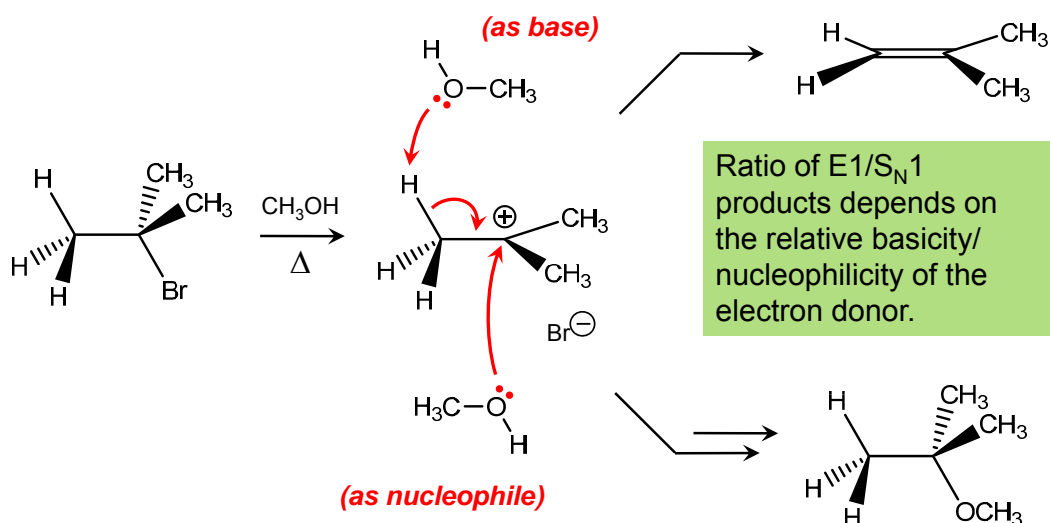


Potential Energy Diagram for E1



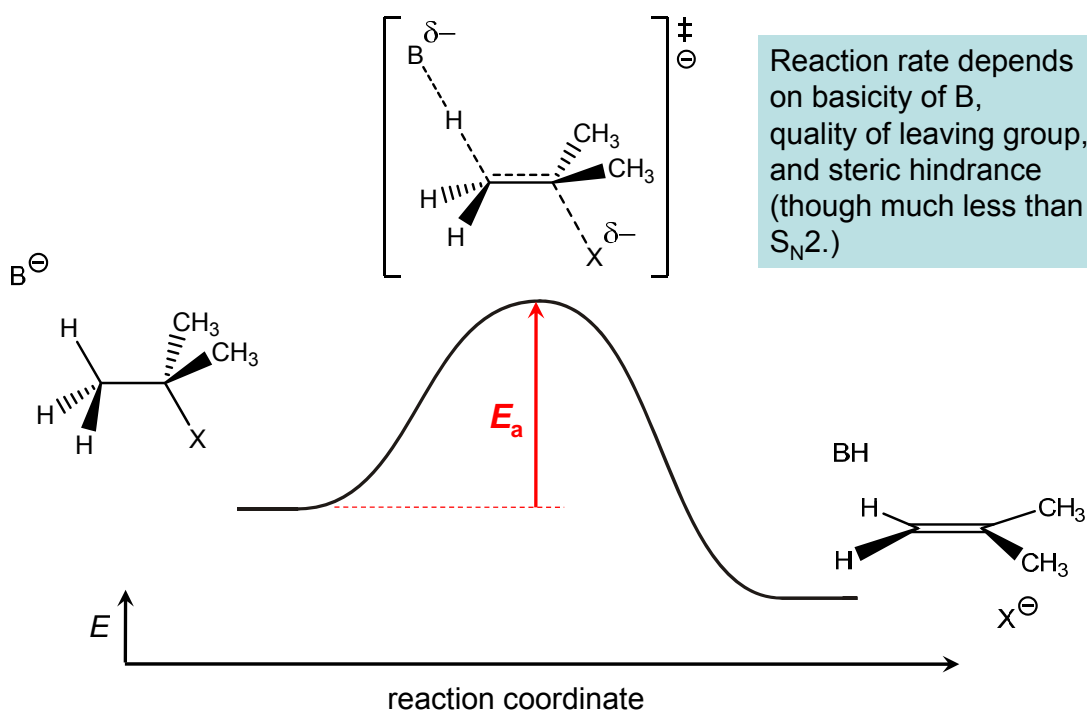
E1 and S_N1 Frequently Occur Together

(because they pass through a common intermediate)



Nucleophilicity and basicity are often correlated. So, difficult to control.

Potential Energy Diagram for E2



Predicting Reaction Patterns

S_N2

- Unhindered 1° halides as substrates (2° ok)
- Better nucleophiles than bases:
 I^- , Br^- , $CH_3CO_2^-$, RS^- , HS^- , CN^- ,
 N_3^-

E2

- 2° or 3° halide as substrate
- Better bases than nucleophiles:
 HO^- , RO^- , (esp. $tBuO^-$), $RC\equiv C^-$,
 R_3N , H_3N

S_N1

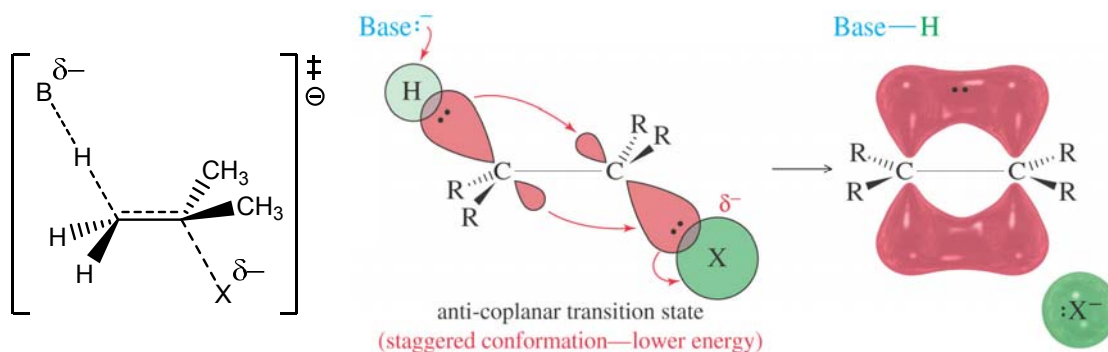
- 2° or 3° halide as substrate
- Neutral or acidic conditions
- Better nucleophiles than bases:
 RSH , H_2S , CH_3COOH

E1

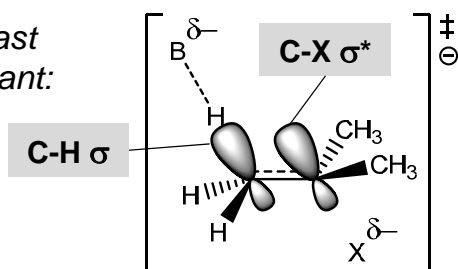
- 2° or 3° halide as substrate
- Neutral or acidic conditions
- Better bases than nucleophiles:
 H_2O , ROH

In E2, Base Approach and Leaving Group are Anti-Periplanar

Your textbook shows:



But, at least as important:



Either way, B---H---C and C---X must be across from each other.

Nomenclature of Alkenes

To use the Cahn-Ingold-Prelog System for naming alkenes,

1. Assign priority numbers (1 and 2) to each group attached to each sp^2 carbon.
2. If #1 priority groups are on the same side of alkene, then configuration is (*Z*); if #1 groups are on opposite sides, then configuration is (*E*).

Example: How would you name the alkene product from the In-Class Exercise we just did?