Elimination Reaction:

When a multiple bond is formed between two neighboring carbon atoms and a small molecule is eliminated from the neighbouring groups that were originally attached to these atoms.

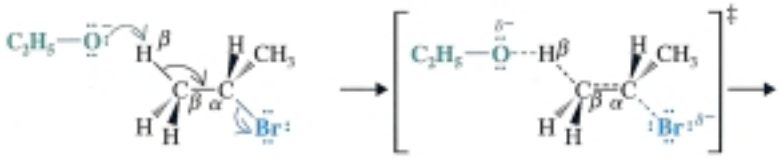
Bimolecular Elimination, E2 Reaction:

- The E2 reaction has a bimolecular, one step mechanism.
  - Closely resembles the S_N2 mechanism.
    - As with S_N2 reactions, the E2 reaction occurs with primary halogenoalkanes.
  - Its rate law thus follows the form:
    - $Rate = k[R-X]^1[Base^-]^1$
- In E2 mechanisms, a nucleophile acting as a base donates a pair of electrons to the β-Hydrogen attached to the β-Carbon atom. At the same time, a C=C double bond is formed while the halide ion is expelled.
- The elimination reactions (both E1 and E2) require a hot, concentrated base such as OH^-.
  - This indicates the reaction has a higher E_A.
- The following is an E2 reaction mechanism between isopropyl bromide and the basic ethoxide ion

REACTION:

$$C_2H_5O^- + CH_3CHBrCH_3 \longrightarrow CH_2{=}CHCH_3 + C_2H_5OH + Br^-$$

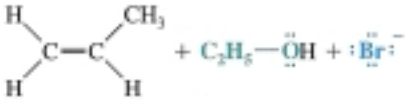
MECHANISM:



The basic ethoxide ion begins to remove a proton from the β carbon using its electron pair to form a bond to it. At the same time, the electron pair of the β C—H bond begins to move in to become the π bond of a double bond and the bromine begins to depart with the electrons that bonded it to the α carbon.

Transition state

Partial bonds now exist between the oxygen and the β hydrogen and between the α carbon and the bromine. The carbon–carbon bond is developing double bond character.



Now the double bond of the alkene is fully formed and the alkene has a trigonal planar geometry at each carbon atom. The other products are a molecule of ethanol and a bromide ion.