

Saytzeff's Rule

Saytzeff's rule in organic chemistry



Saytzeff's rule (also known as Zaitsev's rule) is a principle in organic chemistry that predicts the outcome of elimination reactions, particularly during the formation of alkenes. It states:

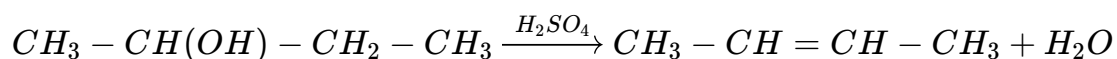
"In the dehydrohalogenation of alkyl halides or dehydration of alcohols, the more substituted alkene (the one with the greater number of alkyl groups attached to the double-bonded carbon atoms) is generally the major product."

Explanation:

- **Substituted Alkenes:** The stability of an alkene increases with the number of alkyl groups attached to the carbon atoms of the double bond due to hyperconjugation and the inductive effect.
- **Reaction Mechanism:** In elimination reactions, a β -hydrogen is removed along with a leaving group, leading to the formation of a double bond. Saytzeff's rule suggests that the hydrogen will be preferentially removed from the carbon atom that leads to the formation of the more substituted, and thus more stable, alkene.

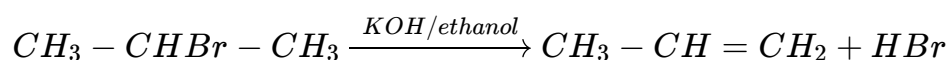
Examples:

1. Dehydration of Butanol:



Here, 2-butene (a more substituted alkene) is the major product compared to 1-butene.

2. Dehydrohalogenation of Ethyl Bromide:



2-propene is the predominant product.

Saytzeff's rule provides a useful guideline for predicting the major product in many elimination reactions. However, it can be overridden by steric factors or specific reaction conditions, leading to exceptions.