Topics Discussed:
- Regiochemistry of E1 and E2
- Predicting Ionic Reactions

Regiochemistry of E1 and E2

Regiochemistry refers to a reaction where more than one constitutional isomer could form.

Zaitsev’s rule- in elimination of H-X from an alkyl halide, the more highly substituted alkane is formed.

Predicting Ionic Reactions

1. Primary Alkyl Halides
   a. Think SN2 for major product
   b. Consider E2 as a competing reaction
      i. Very strong and very bulky (sterically hindered) base
         \[ \text{E2} \]
      ii. i.e. \[ \text{CH}_3^- \]

2. Secondary Alkyl Halides
   a. Think E2 or SN2 for major product
   b. Look for conditions that favor E2
      i. Strong base (i.e. hydroxide) major product E2
      ii. Bulky strong base – virtually all E2
      iii. Antiparaplanar conformation must be easily available for E2
   c. Look for conditions that favor SN2
      i. Good nucleophile that is not a strong base
         \[
         \begin{array}{|c|c|}
         \hline
         \text{Strong bases} & \text{Good nucleophiles that are not strong bases} \\
         -\text{OH} & -\text{CN} \\
         -\text{OR} & \text{H}_3\text{C}-\text{C}=\text{O}^- \\
         -\text{NH}_2 & -\text{SH} \\
         -\text{NHR} & \text{H}_3\text{C}=\text{C}=\text{O}^- \\
         \hline
         \end{array}
         \]
      ii. Antiparaplanar conformation is not available

3. Tertiary Alkyl Halides
   a. Think SN1 or E2
   b. Look for conditions that favor SN1
      i. Weak nucleophile (water, methanol)
   c. Look for conditions that favor E2
      i. Strong base
   d. If major reaction is SN1 consider E1 as minor product