$S_N1$ and $E1$
E1 $\text{rate} = k[\text{substrate}]$

- Dehydration of alcohols is the most common E1 reaction.
- E1 is almost a minor side byproduct in other unimolecular reactions
- Notice the reaction uses $\text{H}^+$ as a catalyst.
- Alkene is co-distilled with water (affects equilibrium)
SN1 \ rate = k[substrate] \\
- The solvent is often the nucleophile, hence the reaction is called a solvolysis \\
- The stability of the carbocation is the primary factor in determining the product. \\
- Since carbocations are intermediates, stereochemistry of products is usually close to racemic. \\
- Carbocations tend to rearrange to attain greater stability via: 
  Hydride shift 
  Methide shift 
  Ring expansion or contraction

Hydride shift:

Methide shift: