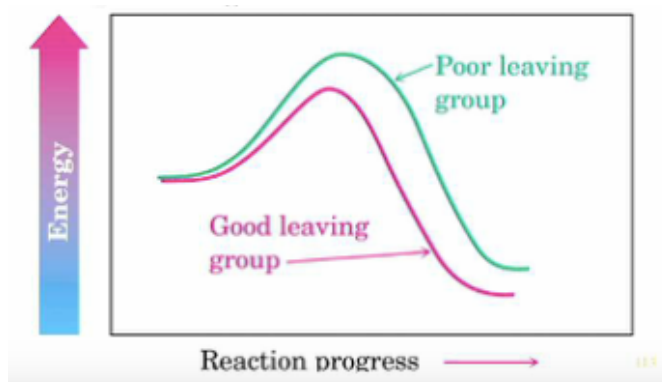


CHEM10004

Lecture Date: 5th August

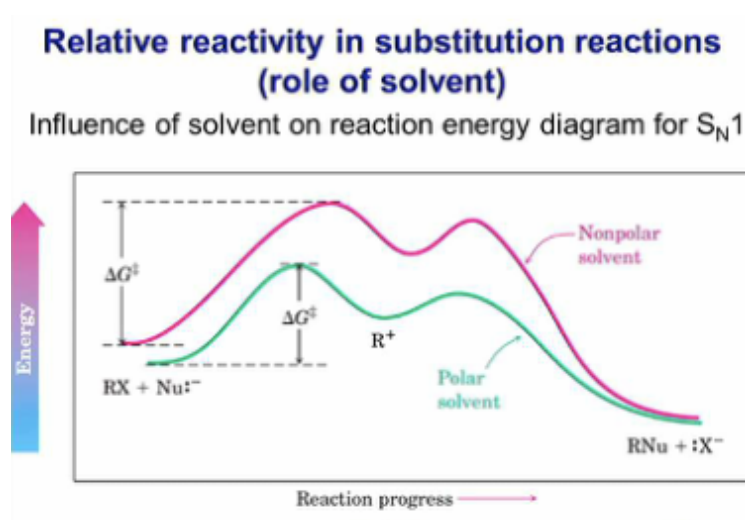
Lecture Subject: Factors affecting each reaction

- Very strong bases (good nucleophiles) aren't going to want to leave so they're never leaving groups in simple substitution reactions
- Good leaving group = stable as an anion = weak base = strong acids with H^+ = poor nucleophile



You can see here that the better leaving group has a lower energy, which means less energy is in the molecule and it is less stable

If you ever get a bit confused with what makes a good/bad leaving group just think... *Do I want this to be a stable or unstable anion?* We want the leaving group to be weak so that it can be replaced by a stronger one



- Role of the solvent in substitution reactions
 - S_N1 – you want to affect the rate-determining step
 - **The more stable the carbocation, the more likely S_N1 will occur**
 1. The feature that holds the S_N1 reactions back from going really fast is the high energy of the highest transition state
 2. The energy of the transition state is pushed up high when there is a strong charge on the molecule
 3. If a solvent can lower the effect of the charge, it can lower the energy of the transition state
 4. A solvent with a high **dielectric constant**, it is better able to disperse this charge, lower its energy and increase the reaction rate
 5. Tend to have quite polar bonds
 6. POLAR PROTIC SOLVENT (hydroxyls or amines which readily donate the H^+)