SN1	E1
Substrate (R) 3^o fast, 2^o slow 1^o impossible **Nucleophile/Base** Does not matter--does not effect rate **Leaving group (X)** Must be stable once left-must be weak base (stable anion) **Solvent** Polar protic works best, polar aprotic also works. **Temperature** competes better with E1 at low temp	**Substrate (R)** 3^o fast, 2^o slow 1^o impossible **Nucleophile/Base** Base Does not matter-- does not effect rate **Leaving group (X)** Must be stable once left-must be weak base (stable anion) **Solvent** Polar protic works best, polar aprotic also works. **Temperature**. Competes with SN1 Better at high temp (above 50 ^oC)
SN2	**E2**
Substrate (R) 1^o best (fast) 2^o slow but possible, 3^o impossible too much steric crowding **Nucleophile/Base** Important, must be strong nucleophile; large atom with a – charge and /or strong base (Br^- SH^- CN^- I^-, RO^-) Bad if nucleophile is too large such as $(CH_3)_3C\text{-}O^-$ **Leaving group (X)** Important: Must be stable once left-must be weak base (stable anion) **Solvent** Polar aprotic is the best (e.g. acetone) Temperature Not important **Steric effect--** Incoming nucleophiles must be small molecules (large <u>atoms</u> ok)	**Substrate (R)** Not much effect-- 1^o, 2^o, 3^o all possibly can react. **Nucleophile/Base**. Must be strong Base, (e.g $R\text{-}0^-$). Strong bulky base is best $(CH_3)_3C\text{-}O^-$ (will not undergo SN2) **Leaving group (X)** Important: Must be stable once left-must be weak base (stable anion) **Solvent** Polar aprotic is the best (e.g. acetone)**.** **Temperature** Competes with SN2 Better at high temp (above 50 C) Note: to compete with SN2 for 2^o substrates must have bulky base