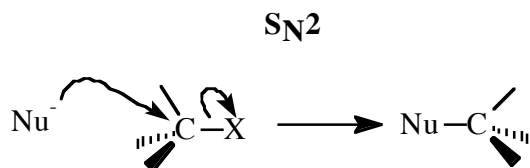
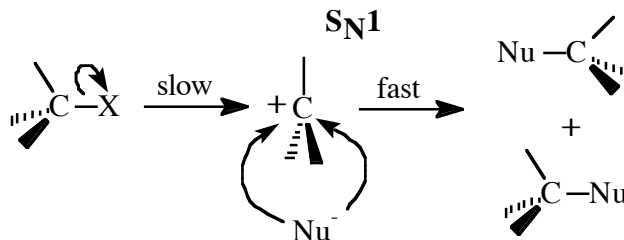


Old Hanson's Guide To Practical Nucleophilic Substitution



Predominant mechanism for CH_3 , 1° , and 2° systems with good nucleophiles.



Predominant mechanism for 3° systems (or other stabilized carbocations with poor nucleophiles).

Common Nucleophiles: Who's Hot and Who's Not

(Protic Solvents. In polar aprotic solvents, nucleophilicity more closely parallels basicity.)

On Fire: RS^-

Hot: I^- , ^-CN , $RC\equiv C^-$, RO^- (nonbulky R), Br^- , N_3^- , RNH_2
(nonbulky R)

Lukewarm: Cl^- , RCO_2^-

Cold as Ice: ROH , F^-

Only really useful for S_N1 -type solvolysis reactions.

The only useful nucleophiles for use with strong acids are I^- , Br^- , Cl^- and ROH .
(The rest get protonated becoming less nucleophilic.)

Factors influencing nucleophilicity: Basicity, Polarizability, Size (Bulkiness), Solvation

Common Leaving Groups

Good leaving groups are conjugate bases of strong acids.

Must be sp^3 carbon.

<u>Reactant</u>	<u>Product</u>	<u>pKa of conjugate acid</u>
	I^- , Br^- , Cl^-	-9 to -7
	H_2O , ROH	-1 to -3
		-0.6 (Ts) to ?
<p>This would be abbreviated: ROTs etc.</p> <p>(R = CH_3, CH_3, CF_3)</p> <p style="margin-left: 40px;">↑ ↑ ↑</p> <p style="margin-left: 40px;">Tosylate Mesylate Triflate (Tf)</p> <p style="margin-left: 40px;">(Ts) (Ms) (One of the world's best leaving groups)</p>		