

	S_N1	S_N2
(A) Structure of R (B) Nature of L	$3^\circ > 2^\circ > 1^\circ > Me$ weakest base is best leaving group, i.e., $I > Br > Cl > F$	$Me > 1^\circ > 2^\circ > 3^\circ$
(C) Nature of Nucleophile	For HNu : (solvent), rate \propto basicity of HNu :	In protic solvents (i) within a periodic table group, rate \propto polarizability of Nu (ii) for same site atom, rate \propto basicity of Nu In aprotic solvents rate \propto basicity of Nu
(D) Solvent effect	Rate \propto H-bonding ability and dielectric constant	Depends on charge type. Polar aprotic solvents lowers "free" most reactive Nu
(E) Determining factor	Stability of R^+	Steric hindrance
(F) Rearrangement	Observed	Not observed, except for allylic
(G) Catalysis	Lewis and Brønsted acids: Ag^+ , $AlCl_3$, and strong HA	Phase transfer Crown ethers

	S_N1	S_N2
a) Number of Steps	Two*: (1) $R:L \xrightarrow{\text{slow}} R^+ + :L^-$ (2) $R^+ + :NuH \xrightarrow{\text{fast}} R:Nu + H^+$	One: $R:L + :Nu^- \rightarrow R:Nu + :L^-$ or $R:L + :NuH \rightarrow R:NuH^+ + :L^-$
b) Reaction Rate and Order	Rate = $k_1 [RL]$; first order	Rate = $k_2 [RL][:Nu^-]$; second order
c) Molecularity	Unimolecular	Bimolecular
d) TS of slow step	$HNu: \cdots C^{\delta+} \cdots L^{\delta-} \cdots HNu$	$\delta^- Nu: \cdots C \cdots L^{\delta-}$ (with $:Nu^-$) $\delta^- HNu: \cdots C \cdots L^{\delta-}$ (with $HNu:$)
e) Stereochemistry	Inversion and retention	Inversion (backside attack)
f) Reacting nucleophile	Nucleophilic solvent; stable R^+ may react with added nucleophile	Added Nucleophile

* The simplified mechanism has two steps; the ion-pair concept has more steps.

	Favours E1	Favours E2
(a) Alkyl group	$3^\circ > 2^\circ > 1^\circ$	$3^\circ > 2^\circ > 1^\circ$
(b) Base strength	Weak	Strong
(c) Leaving group	Weak base $I^- > Br^- > Cl^- > F^-$	Weak base $I^- > Br^- > Cl^- > F^-$
(d) Catalyst	Ag^+ , $AlCl_3$	Phase transfer

	Favours E2	Favours SN2
(a)		
① Alkyl group	$3^\circ > 2^\circ > 1^\circ$	$1^\circ > 2^\circ > 3^\circ$
② Leaving group	$I^- > Br^- > Cl^- > F^-$	$I^- > Br^- > Cl^- > F^-$
③ Reagent	Strong, bulky Brønsted base	Strong nucleophile
④ Solvent		
(i) Low Polarity	Favoured	Slightly favoured
(ii) Protic Polar	Disfavoured	Disfavoured
(iii) Aprotic Polar	Strongly favoured	Favoured
(iv) Phase transfer	Strongly favoured	Favoured
(b)		
① R group	Favours E2	Favours SN1
② X	$3^\circ > 2^\circ > 1^\circ$	$3^\circ > 2^\circ > 1^\circ$
③ Base strength concentration	$I^- > Br^- > Cl^- > F^-$	$I^- > Br^- > Cl^- > F^-$
	Strong High	Very weak Low

	E1	E2
(a) Steps	1. $H-\underset{ }{\overset{ }{C}}-\underset{ }{\overset{ }{C}}-X \rightarrow H-\underset{ }{\overset{ }{C}}-\overset{ }{\overset{ }{C}^+}+X^-$ 2. $H-\underset{ }{\overset{ }{C}}-\overset{ }{\overset{ }{C}^+} \xrightarrow{-H^+} \text{>C=C<}$	$B:^- + H-\underset{ }{\overset{ }{C}}-\underset{ }{\overset{ }{C}}-X \rightarrow B:H + \text{>C=C<} + X^-$
(b) Transition State	1. $H-\underset{ }{\overset{ }{C}}-\overset{\delta+}{\underset{ }{\overset{ }{C}}}-\cdots X^{\delta-}-\cdots HS:$ 2. $HS:\overset{\delta+}{\cdots}-H-\cdots \text{>C}\cdots\text{<C}^{\delta+}$	$B:\overset{\delta-}{\cdots}-H-\cdots \text{>C}\cdots\text{<C}\cdots X^{\delta-}-\cdots HS:$
(c) Kinetic	First-order, unimolecular Rate = $k_1[RX]$; rate of ionization	Second-order, bimolecular Rate = $k_2[RX][B^-]$
(d) Driving force	Ionization of R-X	Attack by $B:^-$ on H
(e) Stereospecificity	Nonstereospecific	anti elimination but syn if anti not possible. (Both coplanar)
(f) Effect of R	Stability of R^+ ; $3^\circ > 2^\circ > 1^\circ$ $3^\circ > 2^\circ > 1^\circ RX$	Alkene stability (Saytzeff Rule)
(g) Rearrangement	Common	None, except for allylic (S_N2)
(h) H/D isotope effect	None	Observed
(i) Competing Reaction	S_N1 , S_N2	S_N2
(j) Regioselectivity	Saytzeff	Usually Saytzeff, but Hofmann with bulky bases (Me_3CO^-)