

Comparison and Contrast of E1 and E2 Reactions

	<u>E1</u>	<u>E2</u>
1. kinetic order	first order	second order
2. stereochemistry	periplanar conformations not required	<i>anti</i> -periplanar or <i>syn</i> -periplanar conformation required (<i>anti</i> - is preferred significantly)
3. transition state(s)?	yes	yes
4. intermediates?	yes	no
5. carbocation intermediates?	yes	no
6. rearrangements (1,2-shifts)	possible (to form an equally or more stable carbocation intermediate)	none
7. primary kinetic isotope effects	not observed	observed
8. hydrogen exchange	not observed	not observed
9. leaving group effect	observed	observed
10. product distribution	more substituted alkenes preferred	more substituted alkenes preferred
11. substrate effects		
effect of substitution on reactivity	$3^\circ \text{R-L} > 2^\circ \text{R-L} > 1^\circ \text{R-L}$	$3^\circ \text{R-L} > 2^\circ \text{R-L} > 1^\circ \text{R-L}$
better leaving group	increased reaction rate	increased reaction rate
12. base		
more basic reagent	no effect	increased reaction rate
increased [base]	no effect	increased reaction rate