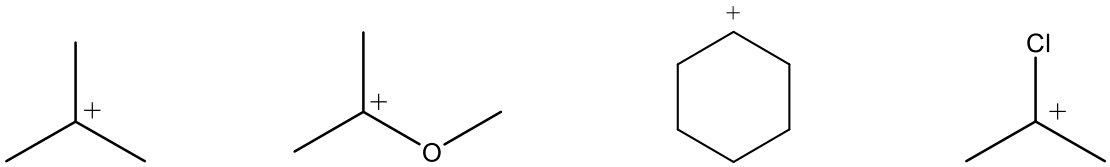
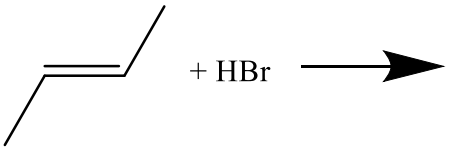
Organic Chemistry I – Townsend
Problem-Set #4
Fall 2018

1. What is hyperconjugation? How does it affect the stability of a carbocation?

2. Identify the Most and least stable molecules and explain why:



3. A. Draw the product of the following reaction and identify the nucleophile and the electrophile.

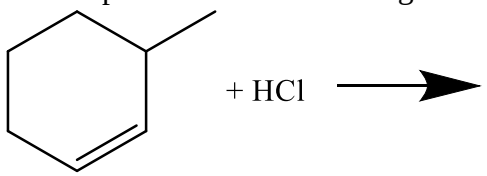


B. Draw the transition states and intermediates of the reaction on an energy diagram given that the reaction is exothermic.

4. What is the Hammond postulate? What would it say about the transition state of the reaction above?

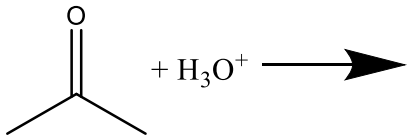
5. Can a chemical reaction be exergonic but endothermic? What can you say about the entropy of such a reaction?

6. A. Draw the product of the following reaction and identify the nucleophile and electrophile



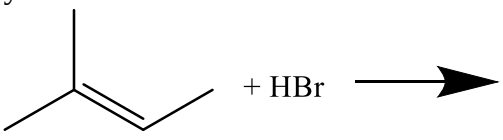
B. What is Markovnikov's rule and how does it explain the major product above? How does it apply to other kinds of reactions?

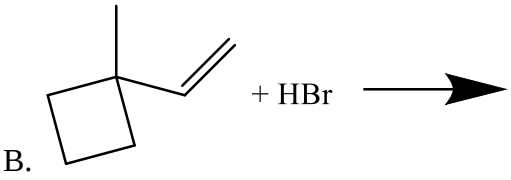
7. Draw the product of the following reaction and identify the nucleophile and electrophile.



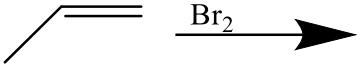
8. Draw all possible products of the following reactions. Identify the most abundant isomer and explain why.

A.



B. 

9. Draw the reaction mechanism for the addition of Br2 to propene.



10. Starting with butane, use any reagents to make 2-butene.

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