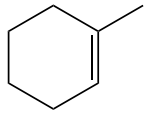
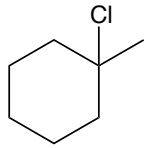
Answers to Problem Set 10

Question 1. Identify the major product of each of the following reactions

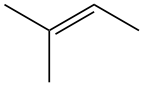
a)



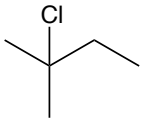
HCl →



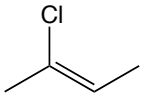
b)



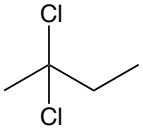
HCl →



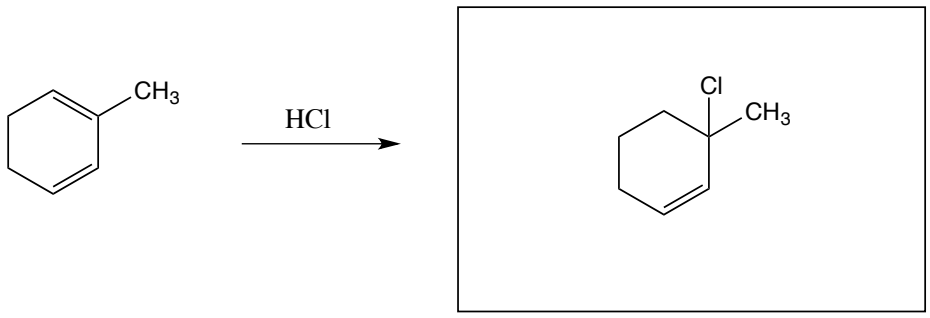
c)



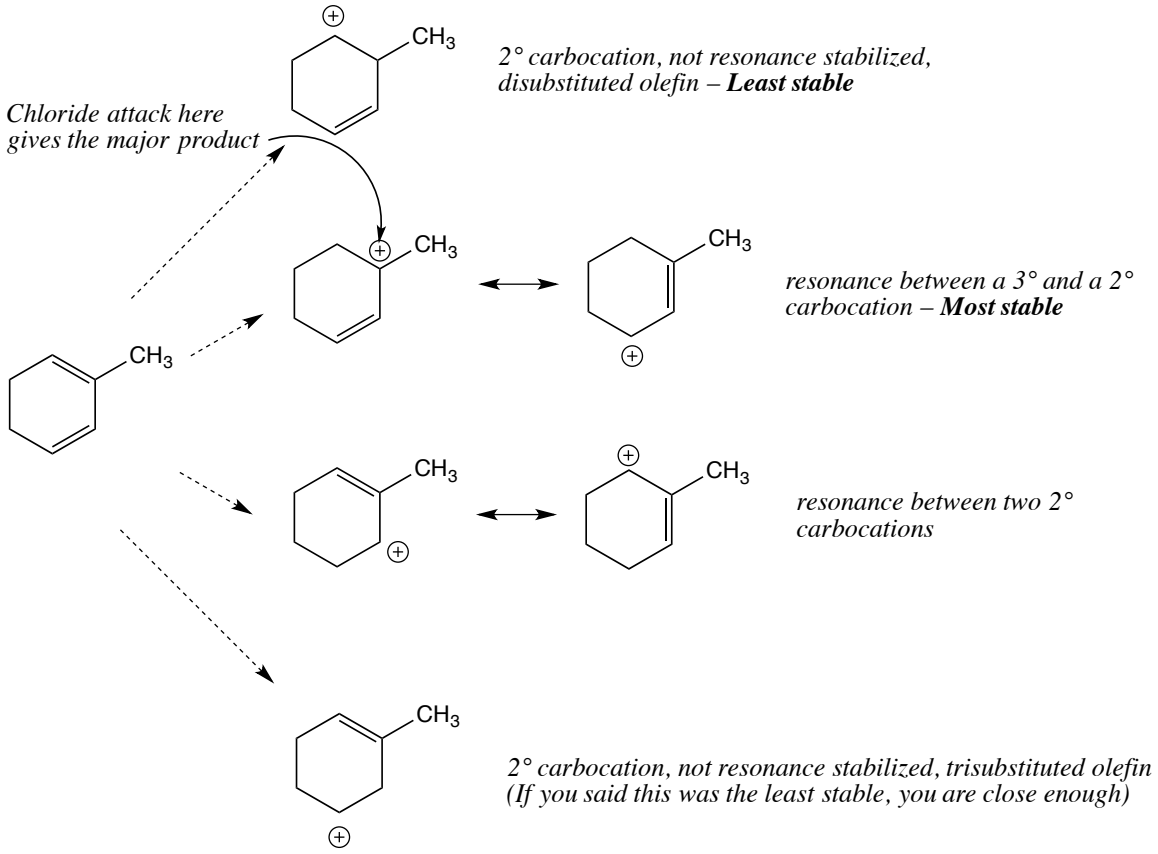
HCl →



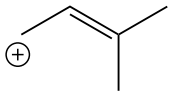
Question 2. a) Provide the major product of the reaction shown below. *Assume that only one molecule of HCl adds*.



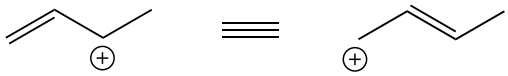
b) Draw all the ***possible*** cationic intermediates for the reaction. Which of these are resonance forms? Which structure is most stable? Least stable?



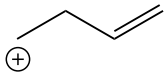
Question 3. Rank the following carbocations from most to least stable.



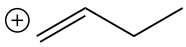
Most stable – resonance between 1° and 3° carbocations



resonace between 1° and 2° carbocations - these structures were both given, but they are resonace structures of the same compound

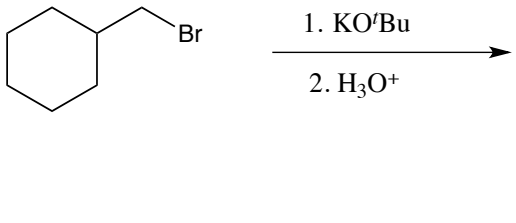


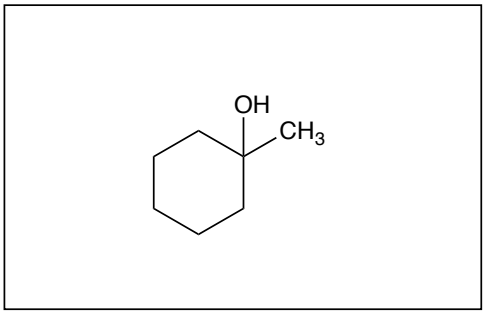
localized 1° carbocation

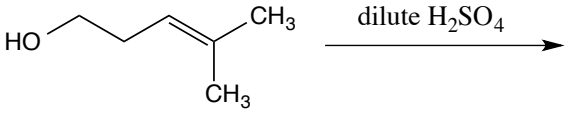


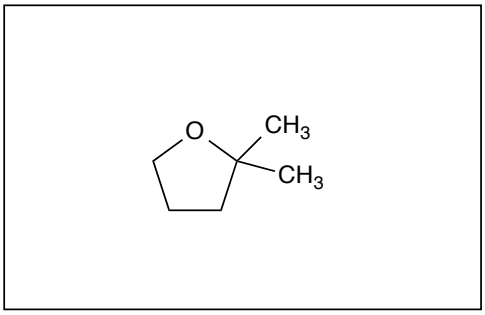
Least stable (or similar to a 1° cation) – a vinyl cation. This also has no resonance stabilization.

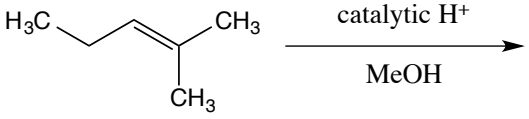
Question 4. Provide the major product of the following reactions.

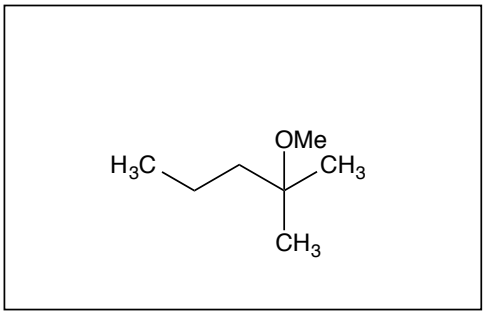
a) 

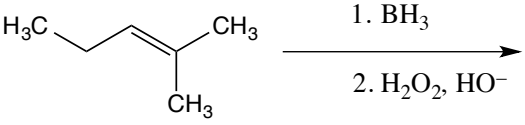


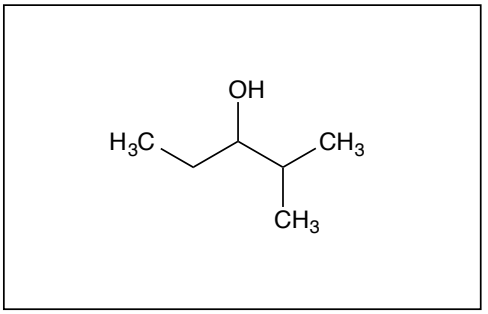
b) 



c) 



d) 



Question 5. Provide a mechanism for the following transformation. *Hint: work both forwards from the starting material and backwards from the product.*