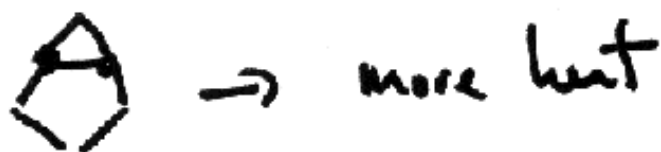
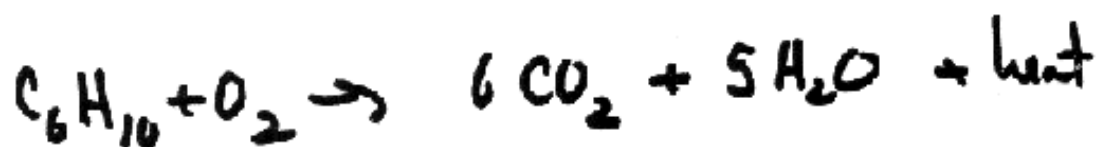
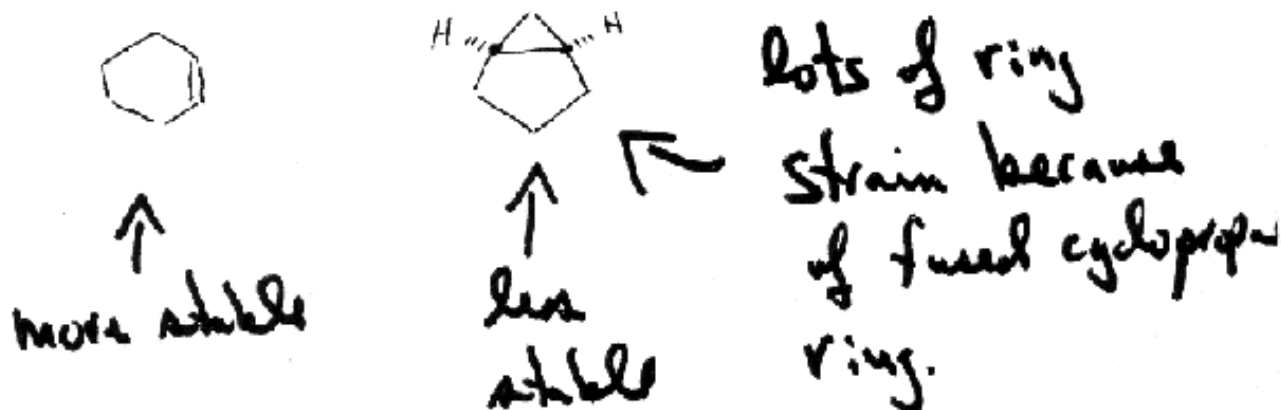
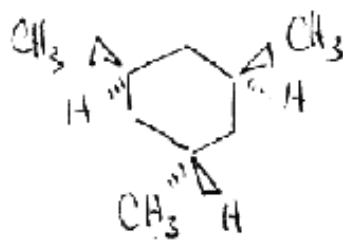
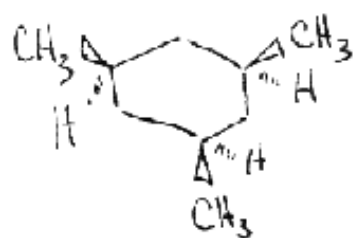


Name: Key (please print)

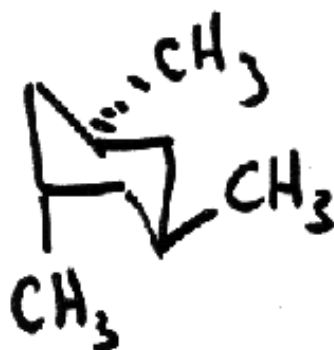
1. (10 pts) Consider the heat of combustion of bicyclo[3.1.0]hexane and cyclohexene.
Which will have the large heat of combustion? Why? Which isomer is more stable?



2. (10 pts) Which of these stereoisomeric 1, 3, 5 trimethylcyclohexanes is more stable?

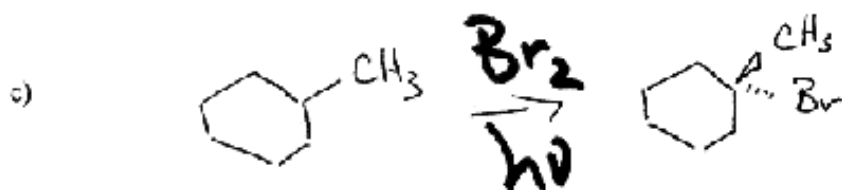
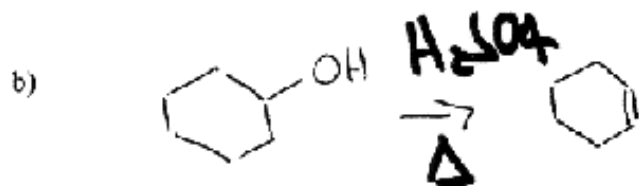
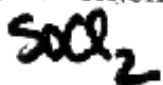
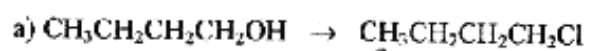


cis is more stable; all CH_3 - are equatorial

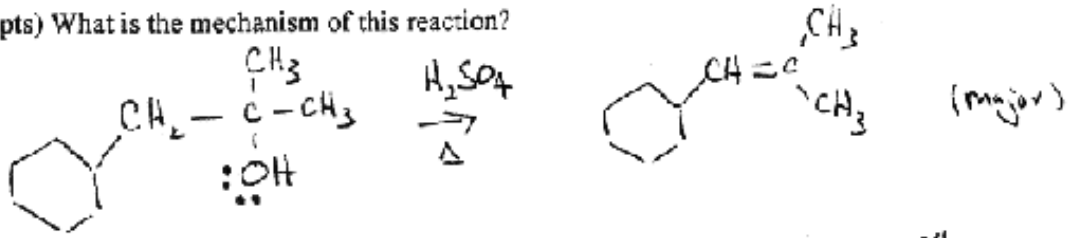


trans is less stable
one axial CH_3 -

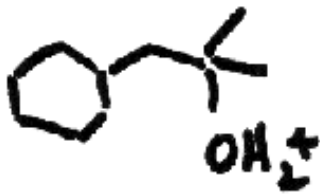
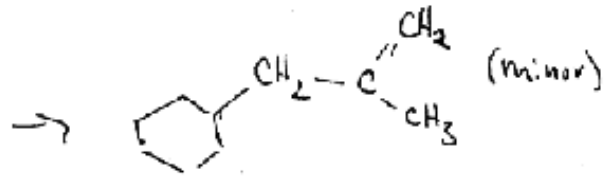
3. (20 pts) Carry out the following transformations. Use any reagents you like.



4. (10 pts) What is the mechanism of this reaction?

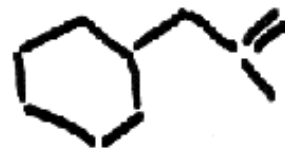


✓✓



✓✓

3° im



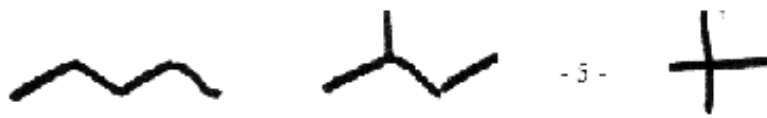
minor product



Saytzeff Rule



major product

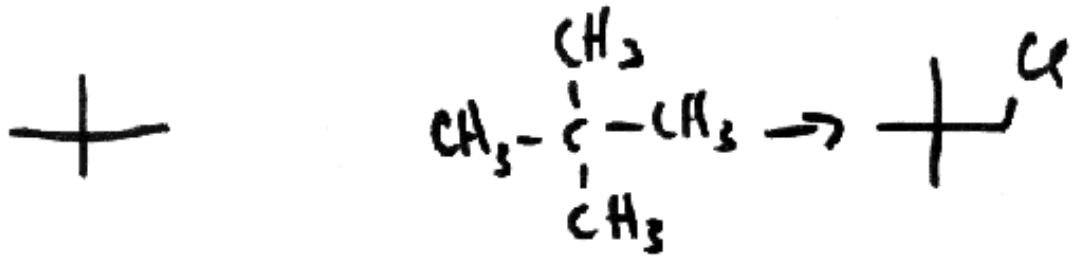


- 5 -

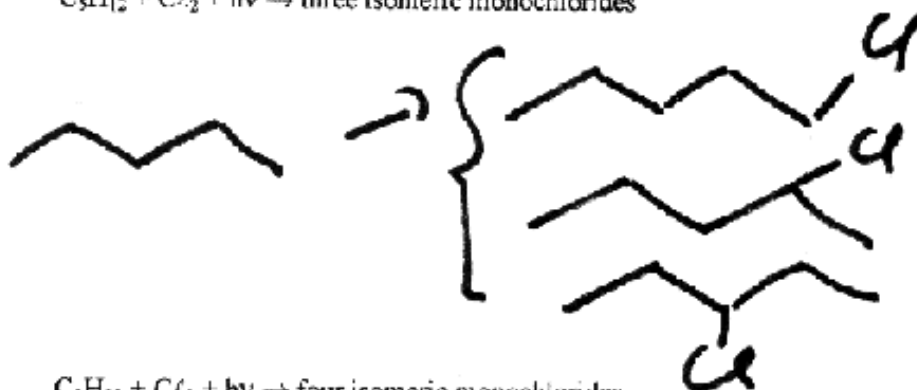
2/20/97

5. (20 pts) Consider the all isomers of C_5H_{12} . Identify the isomer that yields:

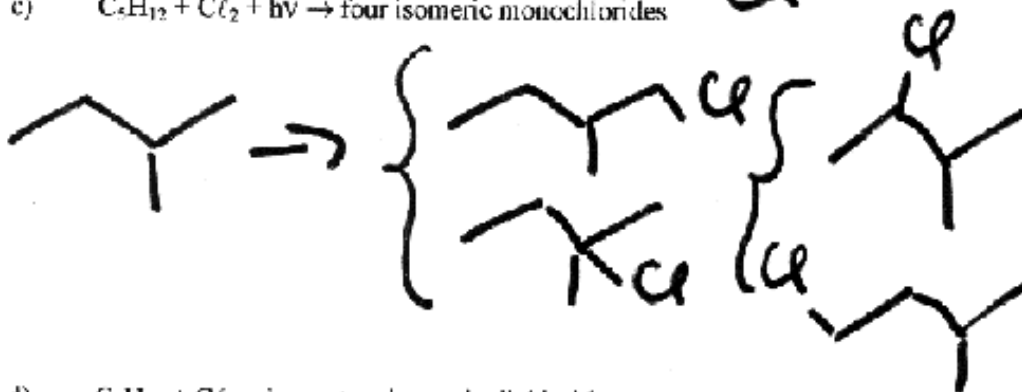
a) $C_5H_{12} + Cl_2 + hv \rightarrow$ a single monochloride



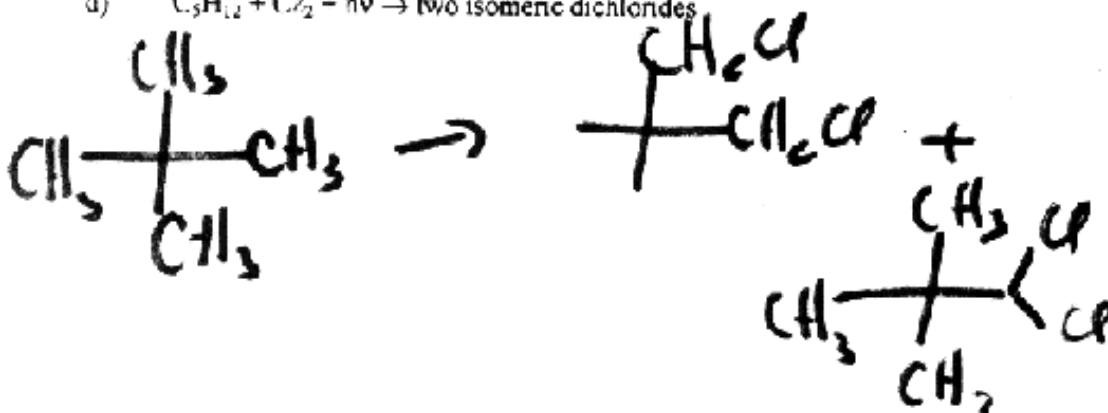
b) $C_5H_{12} + Cl_2 + hv \rightarrow$ three isomeric monochlorides



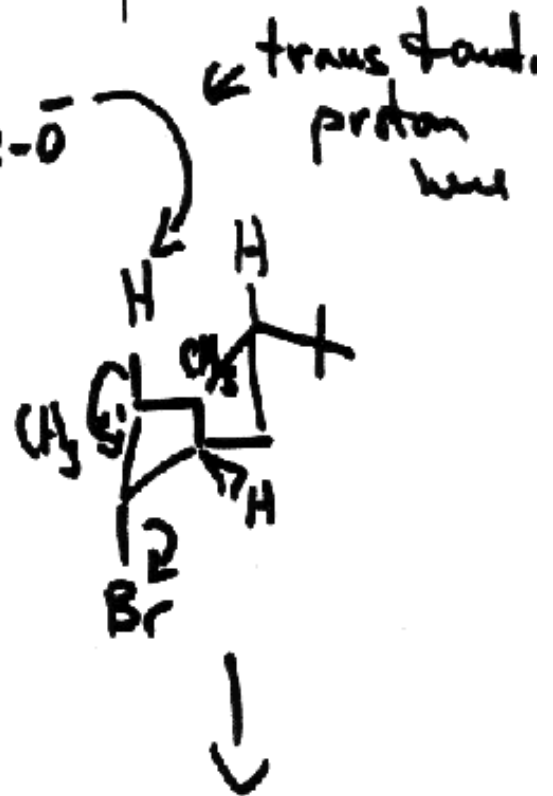
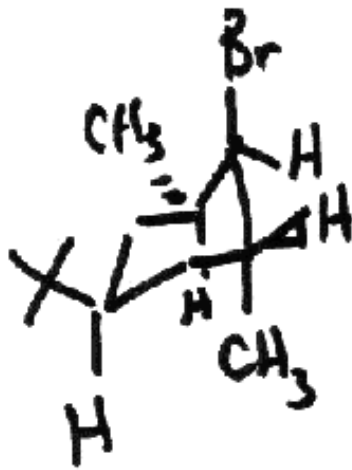
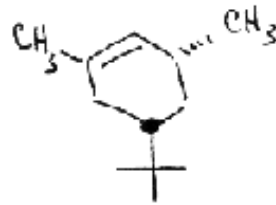
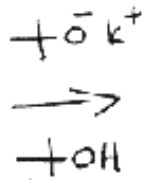
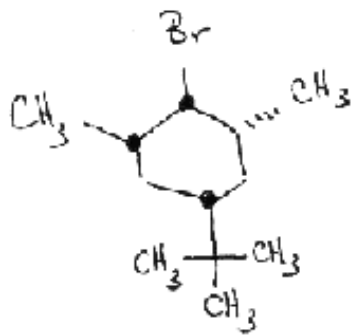
c) $C_5H_{12} + Cl_2 + hv \rightarrow$ four isomeric monochlorides



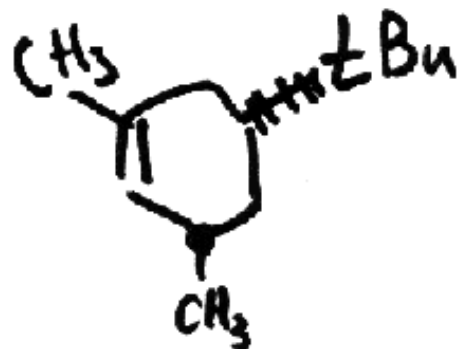
d) $C_5H_{12} + Cl_2 + hv \rightarrow$ two isomeric dichlorides



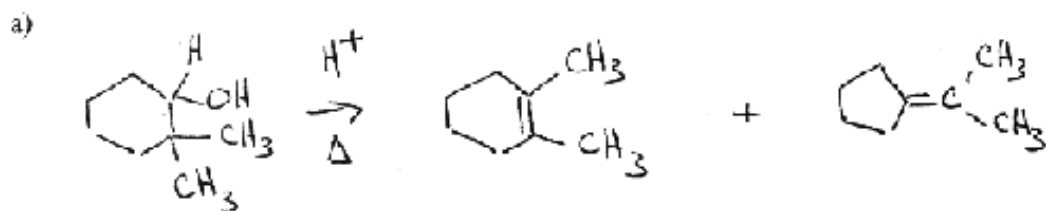
6. (10 pts) When the following bromide are subjected to elimination, you find only one product. Why? What is the mechanism of ~~the~~ reaction?



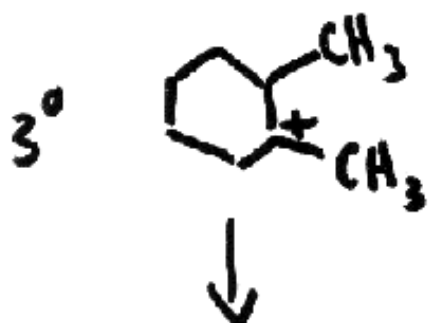
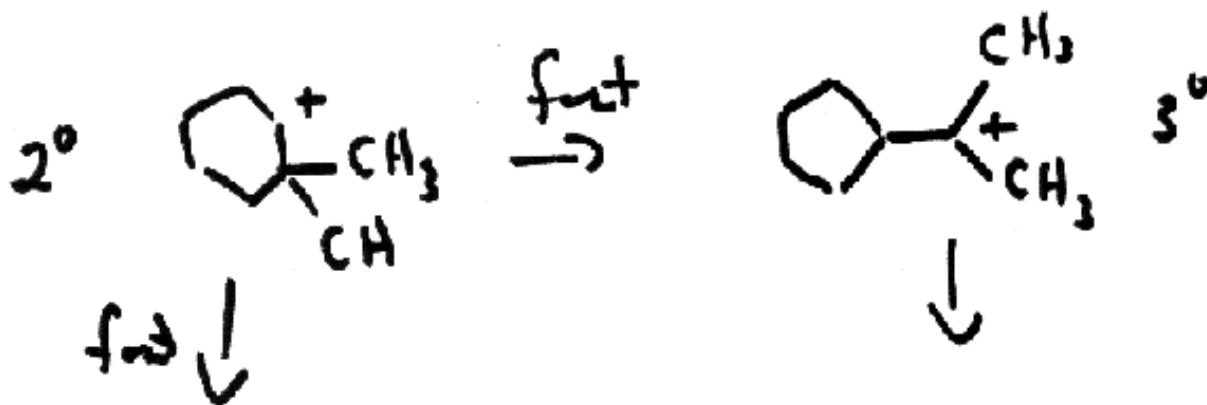
L. bulge group locks conformation of the ring.



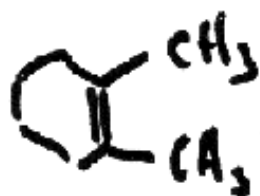
7. (20 pts) What is the mechanism the following reactions?



✓✓



Saytzeff

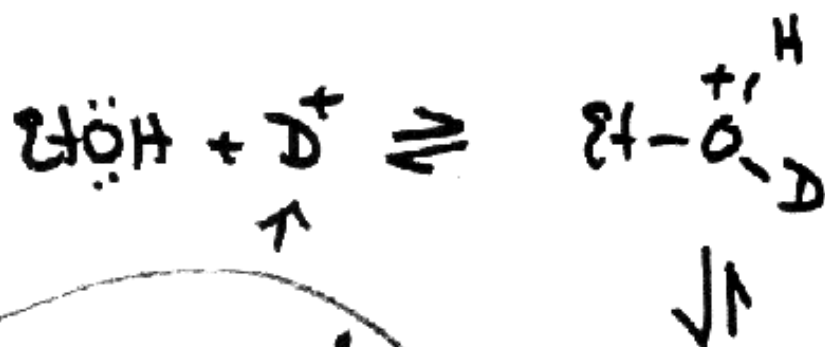


Saytzeff

b) D_2O is water in which the protons (H) have been replaced by the heavier isotope deuterium, D. When CH_3CH_2OH is added to D_2O/D^+ , the OH is rapidly exchanged.



What's the mechanism?



huge excess of
 D_2O/D^+
 pushes
 equilib. \rightleftharpoons to end