

Please print:

Last name: _____

First name: _____

Chem 2061 Exam 2

Fall 2005

Andy Aspaas, Instructor

Friday, October 7, 2005

Instructions:

Time: You have 55 minutes to complete this exam.

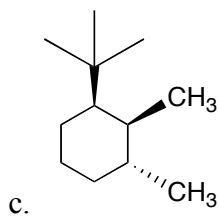
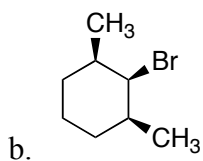
You may use a model kit for this exam.

I, _____ have read and understand the directions given above, and pledge that I will follow all regulations with regard to Academic Dishonesty as outlined by this college when taking this exam.

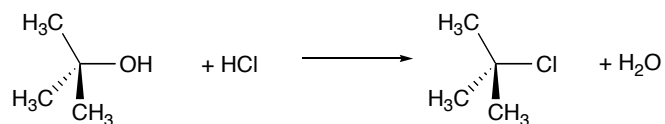
Signature _____ Date and Time _____

1. Draw a chair structure of the most stable conformation of the following molecules:

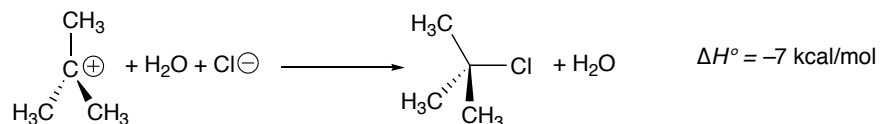
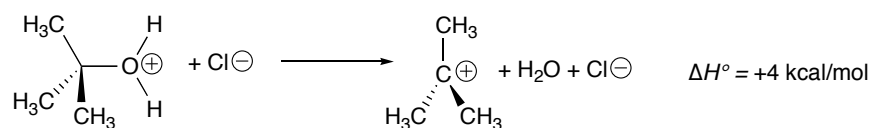
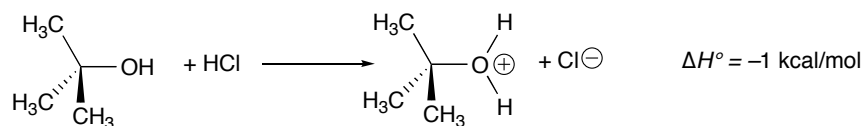
a. *trans*-1-isopropyl-3-methylcyclohexane



2. Consider the following overall reaction, which you have *not* seen before:



This reaction takes place in 3 steps, as follows:

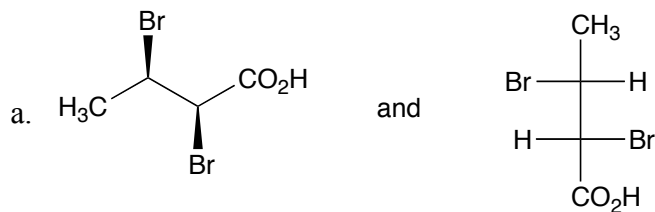


- a.
- Draw a reaction-energy diagram for this reaction, assuming that endothermic steps have considerably higher activation energy than exothermic steps.
 - Label “reactants”, “intermediates 1”, “intermediates 2”, and “products”.
 - Draw double-daggers at the transition states.
 - Label E_{a1} , E_{a2} , and E_{a3}

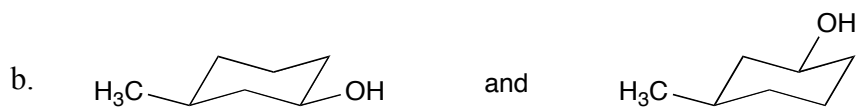
b. Of the three steps, which is rate-limiting?

c. What is the overall ΔH° for the reaction?

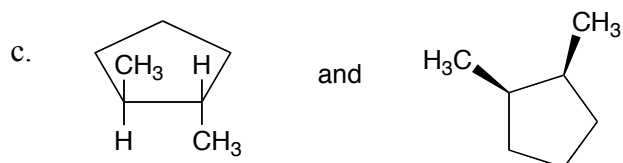
3. For the following pairs compounds,
- Star all asymmetric carbons
 - Assign all configurations (*R*) or (*S*)
 - Indicate whether the pairs are the same compound, enantiomers, diastereomers, or constitutional isomers.
 - If any compounds are meso, label them as such.



relationship: _____

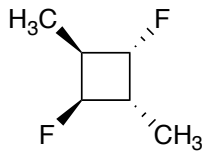


relationship: _____



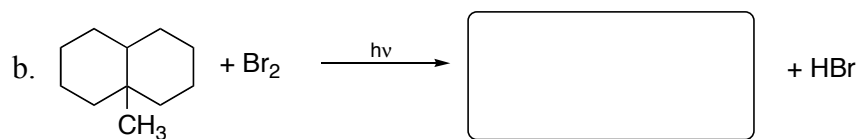
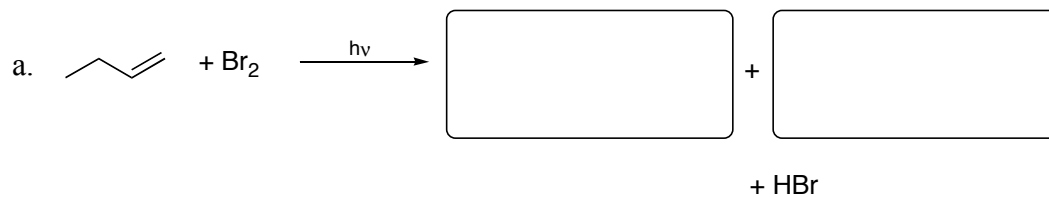
relationship: _____

4. Consider the following molecule:



- Is it meso? Why/why not? Draw the mirror plane if it is.
- Is it chiral? Why/why not?

5. Indicate the major product(s) for the following reactions:



c. Draw the two propagation steps for reaction b above.

d. When bonds are broken, energy is (absorbed / released). *Circle one.*

e. When bonds are formed, energy is (absorbed / released). *Circle one.*