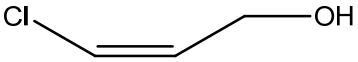
Organic 211 Test # 2 October 8, 2013

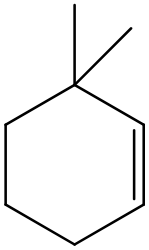
Name:_____

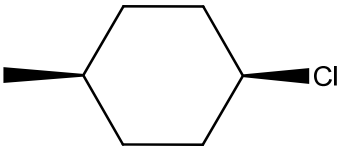
Directions: Work every question. NO CALCULATORS ALLOWED.

1) Match the name to the drawing. This could be very tricky. Write Not Here if the correct name is not one of the possibilities. (2 pts. each, 14 total)

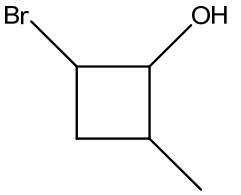
a) 

_____ A = 2-bromo-4-methylcyclobutan-1-ol

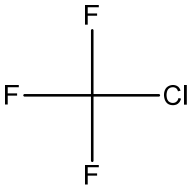
b)  _____ B = R-12

c) 

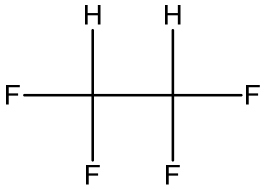
_____ C = 1,1-dimethylcyclohexene

d) 

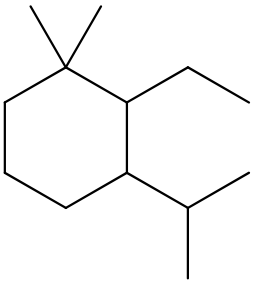
_____ D = R-134

e) 

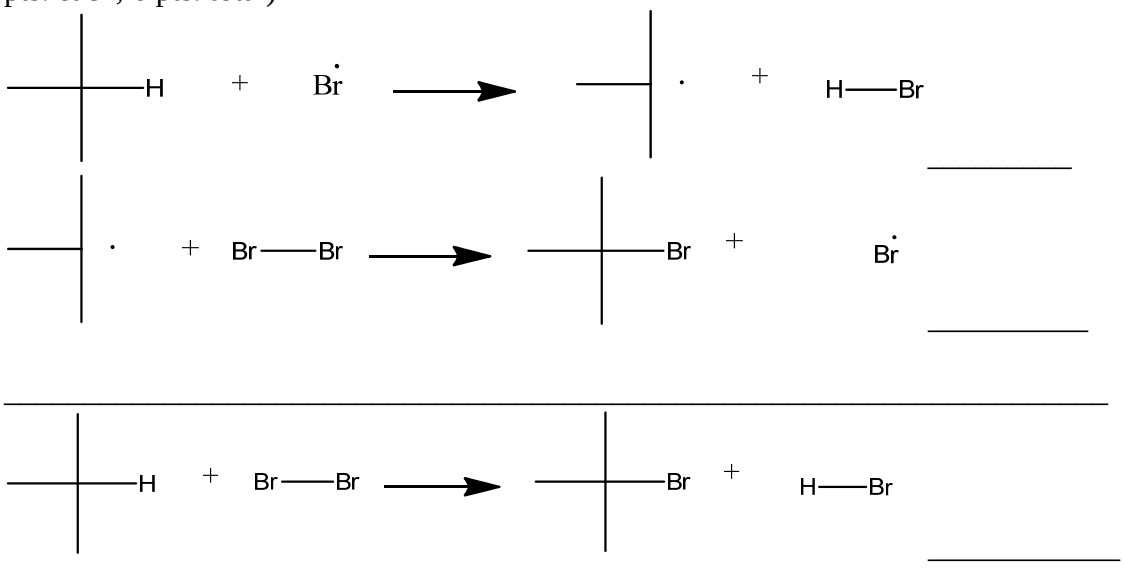
_____ E-1-chloroprop-1-en-3-ol

f) 

_____ F = Cis-4-chloro-1-methylcyclohexane

g)  _____ G = 2-ethyl-3-isopropyl-1,1 -dimethylcyclohexane

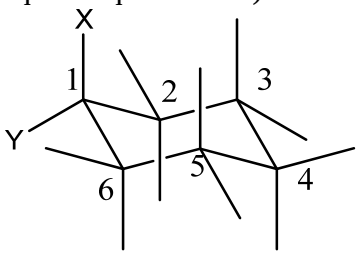
2) Bromination of isobutane is a two step reaction. Using the bond dissociation enthalpy values given, calculate the enthalpy of each step and the enthalpy of the total reaction. (2 pts. each, 6 pts. total)



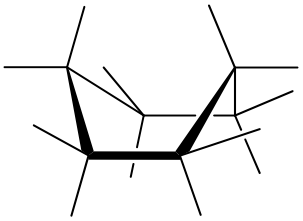
Bond Dissociation Enthalpy	Bond Broken
436	H-H
193	Br-Br
366	H-Br
400	$(CH_3)_3C$-H
292	$(CH_3)_3C$-Br

3) Draw a potential energy diagram for the reactions above. (5 pts.)

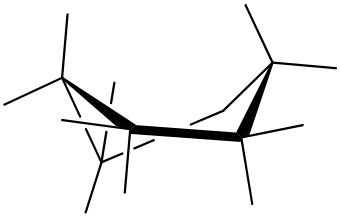
4) For the following cyclohexane, a) fill out the rest of the molecule with ax for axial and eq. for equatorial. b) Circle the positions that are Gauche to Y [if any]. (5 pts.)



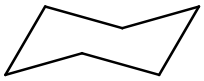
5) Given below is the graph of energy versus conformations of cyclohexane. Put the correct chair conformation next to the appropriate letter. (5 pts.)



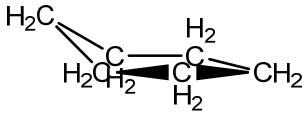
Boat



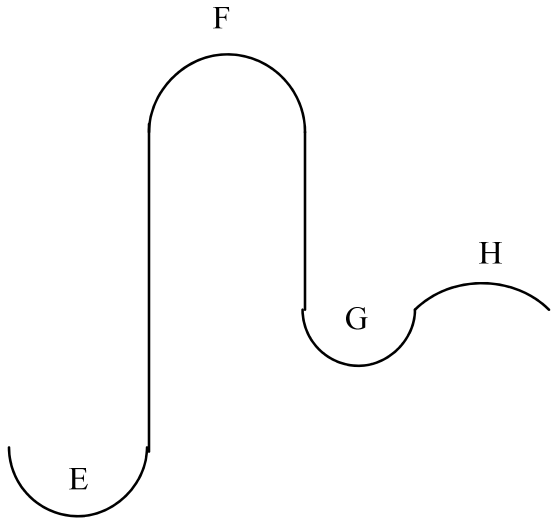
Twist-boat



Chair



Half-Chair

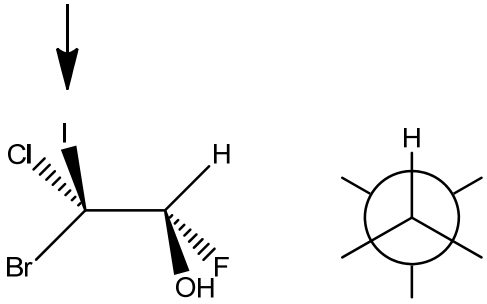


E is _____ F is _____

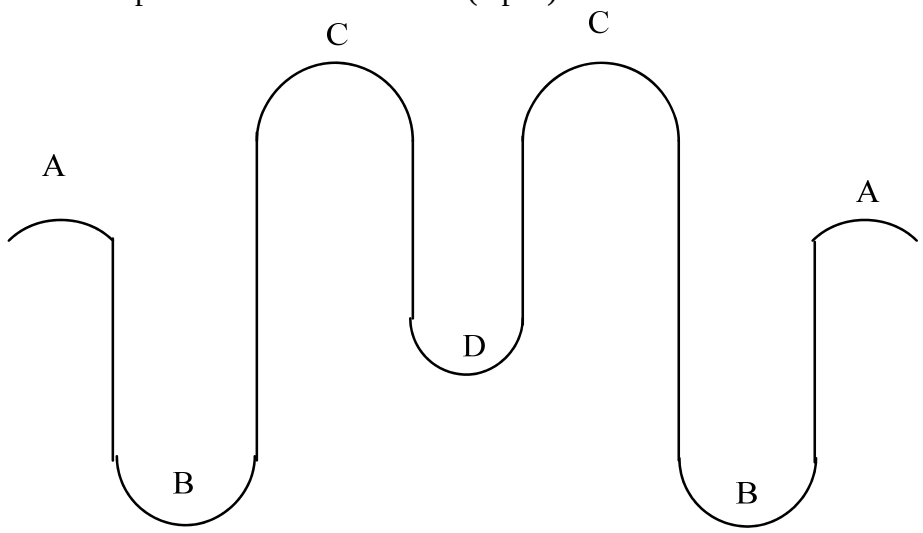
G is _____ H is _____

6) Translate the drawing on the left into the conformer on the right. (5 pts.)

This is iodine.



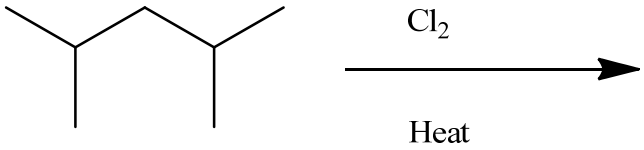
7) Isopentane (2-methylbutane) has four Newman projections looking down the C2-C3 bond. The rotation versus energy diagram is shown below. Draw the Newman projections that correspond to the letters below. (8 pts.)



A is _____ C is _____

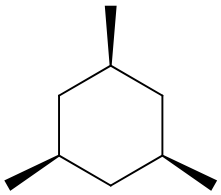
B is _____ D is _____

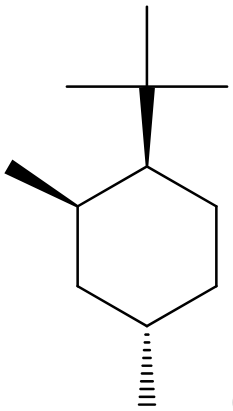
8) a) Draw the products for the following reaction. (3 pts.)



b) Indicate how much of each product is formed given the following reactivities: Primary 1, Secondary 3.9 Tertiary 5.2. Show your work. NO CALCULATORS ALLOWED. Fractions are allowed. (5 pts.)

9) Draw BOTH chair conformations for the following molecules. Circle the one that is most stable or indicate if they are of equal stability.

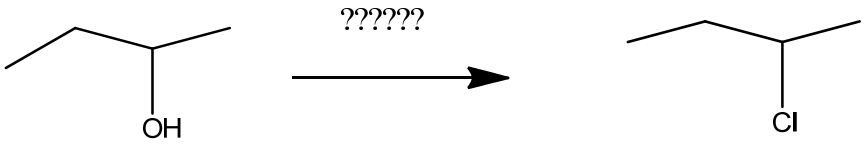
a)  (4 pts.)

b)  (4 pts.)

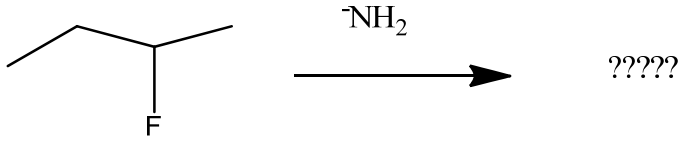
10) Compound A is a primary alcohol ($C_6H_{12}O$). Reaction with an acid forms an alkene, Compound B (C_6H_{10}). Hydogenation of Compound B forms cyclohexane. Reaction of Compound A with $SOCl_2$ forms a primary halide Compound C. (5 pts.)

11) Give the missing reactant, reagent or products for the following reactions. Indicate if no reaction is possible. (2 pts. each, 10 pts. total)

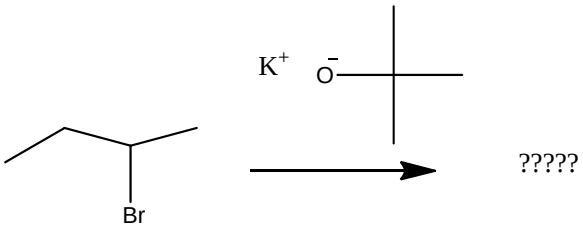
a)



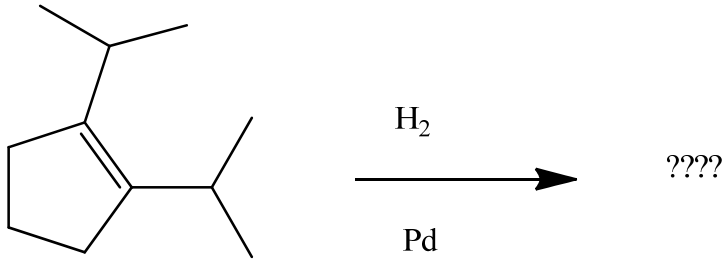
b)



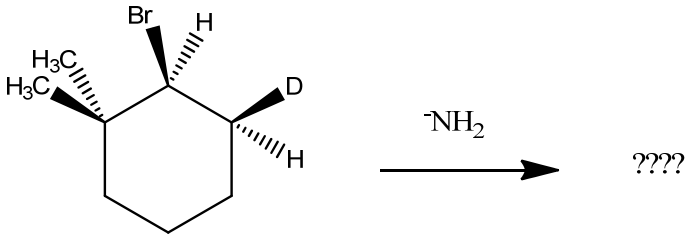
c)



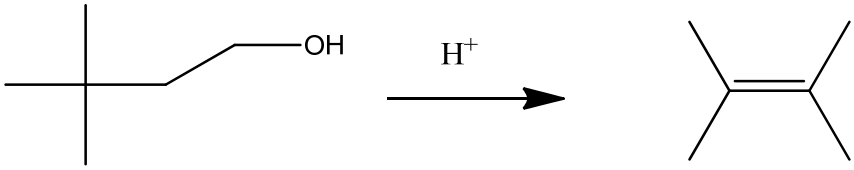
d)



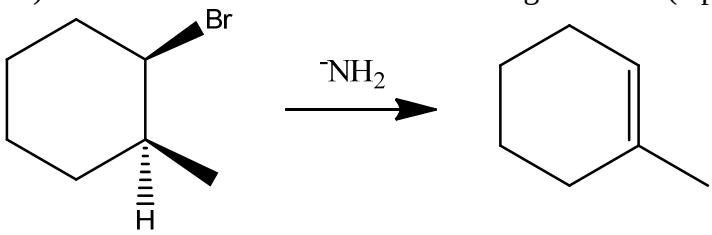
e)



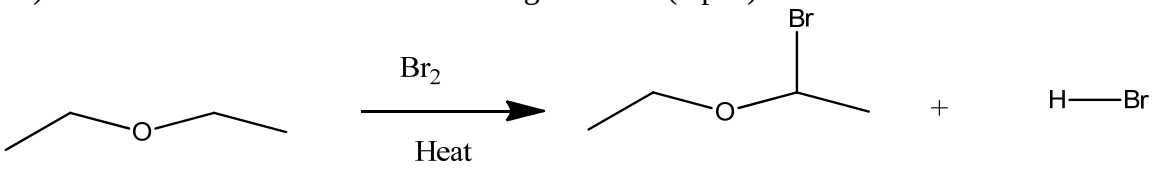
12) Give the mechanism for the following reaction. (6 pts.)



13) Give the mechanism for the following reaction. (5 pts.)



14) Give the mechanism for the following reaction. (6 pts.)



15) Free Question: Give something you studied that was not asked on this test. (4 pts.)