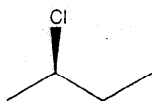


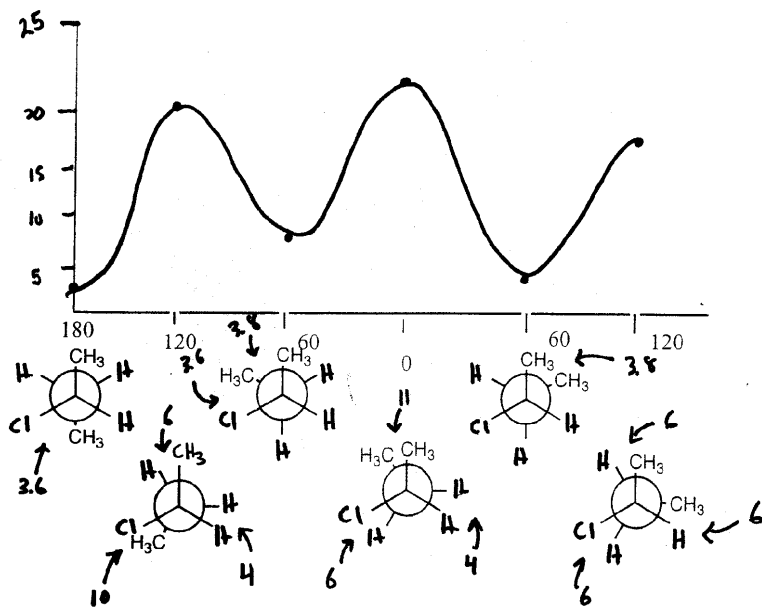
Exam 2
7/23/2008
Chm 122

Name: 99 pts.
I agree to observe the Wake Forest
Honor Code during this exam.

1. (15 pts) Consider (2R)-2-chlorobutane. Sighting down the C2-C3 bond and given the following energies draw a semi-qualitative graph of energy vs. rotation. Consider 180 degrees to be where the two largest groups are anti-staggered and rotate the C3 clockwise. Draw each Newman projection.

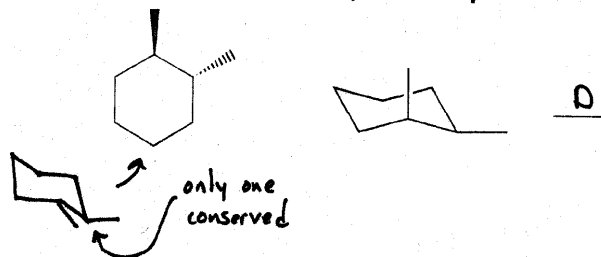
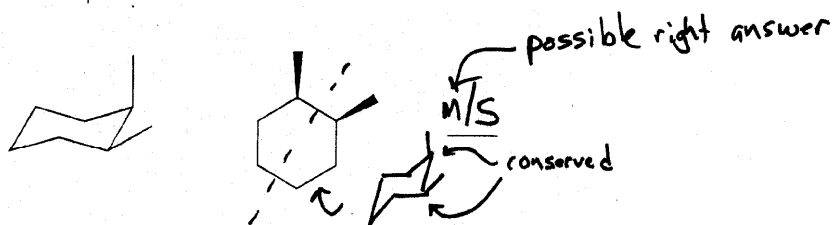
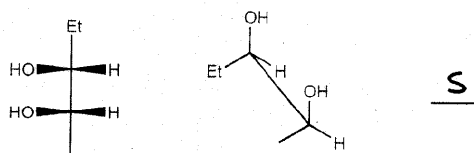
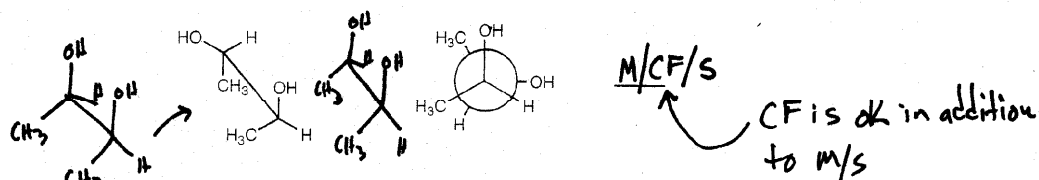
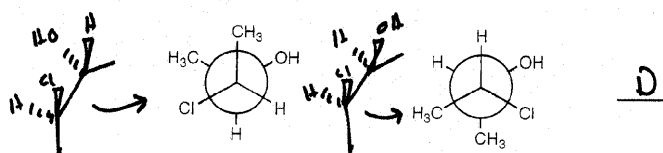
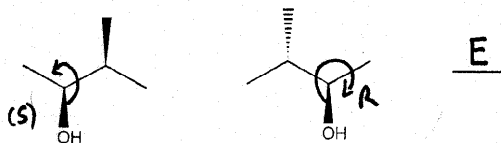


Interaction	E (KJ/mol)
Eclipsed Me-Me	11
Eclipsed Me-Cl	10
Eclipsed Me-H	6.0
Eclipsed H-H	4.0
Eclipsed Cl-H	6.0
Gauche Me-Me	3.8
Gauche Me-Cl	3.6

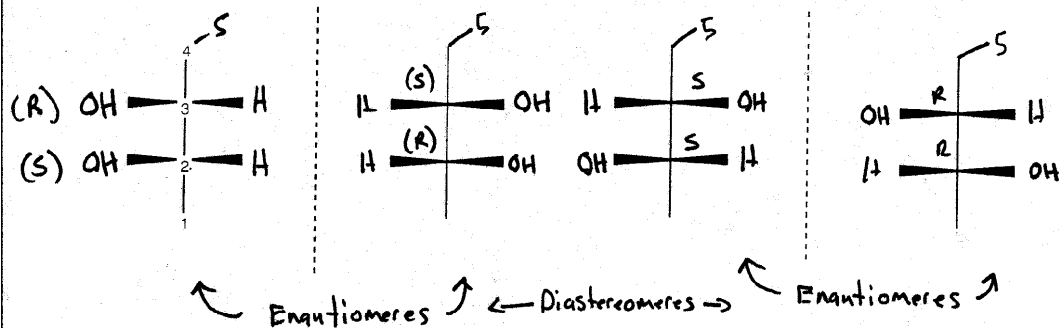


(3.6 → 20 → 7.4 → 21 → 3.8 → 18) KJ/mol

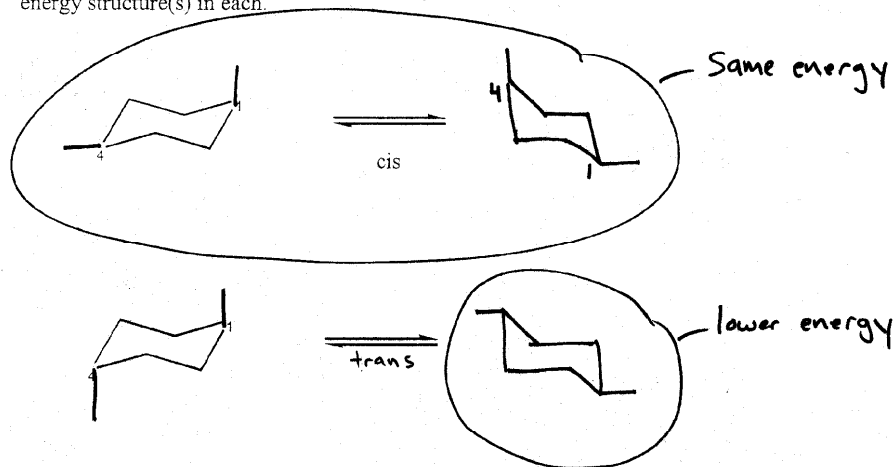
2. Indicate if the pair of molecule shown represents diastereomers (D), enantiomers (E), meso compounds (M), the same compound (S), constitutional isomers (C) or conformational isomers (CF). The pair may be both M and S or CF and S. If this is the case, so indicate. Be very, very careful these are designed to evaluate your mental as well as model-eye-hand coordination. 24 points (4 pts each)



3. (20 pts) a. Draw all the stereoisomers of 2,3-pentanediol using Fisher projections.
 b. Assign R and S absolute configuration to each chiral center.
 c. Indicate the stereochemical relationships (enantiomer, diastereomers, meso, etc) between all isomers.



4. (20 pts) Draw the chair conformations of cis and trans-1,4-dimethylcyclohexane. Circle the lowest energy structure(s) in each.



5. (20 pts) Ketones react with cyanides to alcohols. Below 2-butanone reacts with cyanide to yield +/- 2-cyano-2-butanol. Assign the *Re* and *Si* faces of the ketone and determine which addition gives the R and S stereoisomer. Be neat and clear.

