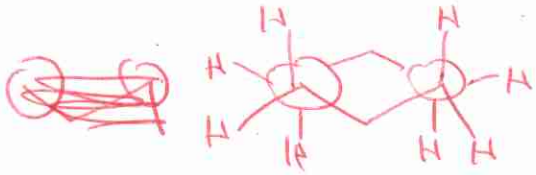
Assignment # 7
Organic 211
Fall 2020

Name:_____

1) Give the Newman projection of both chair and boat cyclohexane.



Chair

boat

2) Which do you expect to be the more stable conformation of cis-1,3-dimethylcyclobutane, A or B? Why?

A

B

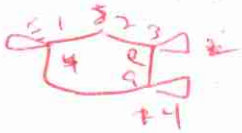
A has 1,3-diaxial interactions which make A less stable than B

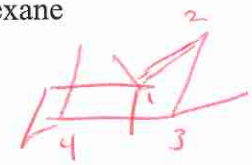
3) Write structural formula for the most stable conformation of the following compounds.

a) cis-1-Isopropyl-3-methylcyclohexane

groups are both equatorial

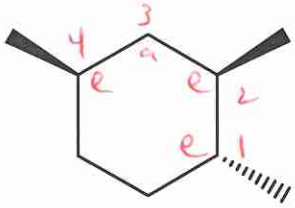
b) cis-1,1,3,4-Tetramethylcyclohexane

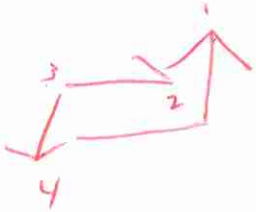




no 1,3 diaxial interaction

c)

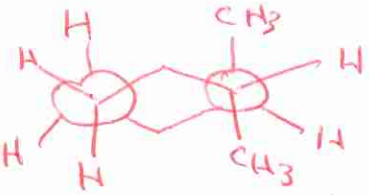




all groups are equatorial.

both axial

4) Draw a Newman projection for the LEAST STABLE chair cyclohexane of trans-1,2-dimethylcyclohexane.

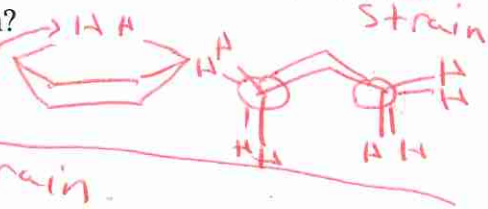


5) Why is the chair conformation more stable than the boat conformation?

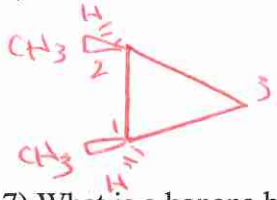
the chair has no torsional strain or van der walls strain.

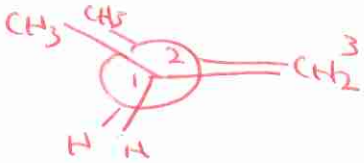
torsional Strain

van der Walls



6) Draw the Newman projection of cis-1,2-dimethylcyclopropane.



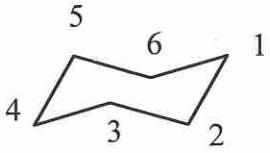


7) What is a banana bond?

" the maximum electron density does not correspond to the internuclear axis. " from wikipedia.

See cyclopropane

8) Use the drawing below to answer the following questions.



a) Is a methyl group at C-6 that is down axial or equatorial?

axial

b) Is a methyl group that is up at C-1 more less stable than methyl group that is up at C-4?

less $ stable. it is axial at C-1

c) Place a methyl group at C-3 in its most stable conformation. Is it up or down?

down - equatorial

9) Draw cholesterol showing the chair conformations of the cyclohexane rings.

top of pg 3

Notes 6