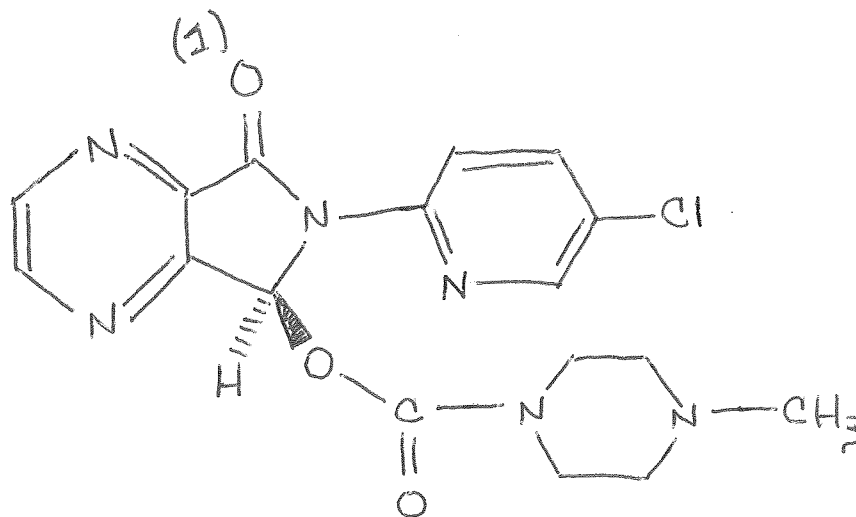


Organic Chemistry I
Exam #1 SI Review
Tuesday, September 18th

6:00 - 8:00 PM
Steven's Auditorium

*"A mosquito was heard to complain:
'I fear they have addled my brain!'
The cause of his sorrow
Was para-Dichloro-
Diphenyl-Trichloroethane! (DDT)"
-Dr. D. D. Perrin*

1. Below is the structure for eszopiclone, a sedative used to treat insomnia...



a) How many sigma bonds are present in the molecule?

b) How many electrons exist in pi-bonds?

c) What is the hybridization of the oxygen atom (1)?

d) How many lone pairs are present in the molecule?

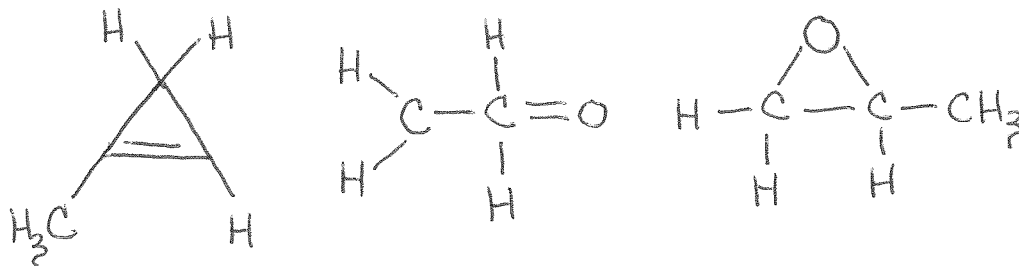
2. Propose structures for the following molecular formulas; indicate lone pairs present and predict the molecular geometry of each structure.

a) CS₂

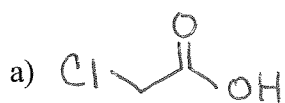
b) CH₂O

c) HCN

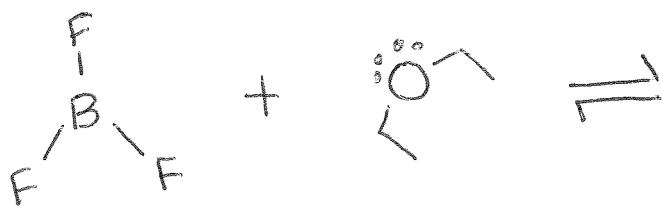
3. Circle the structure(s) not consistent with valence rules.



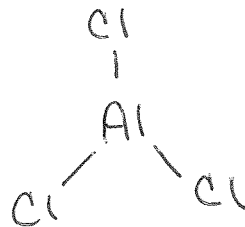
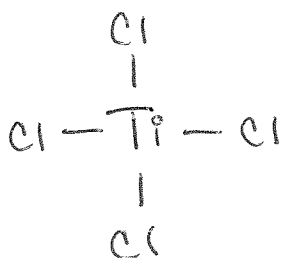
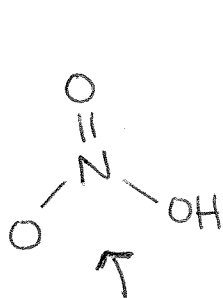
4. Rank the following molecules regarding acidity, labeling the most acidic 1 and the least acidic 3.



5. What type of acid/base reaction is this? Label the acid, the base, and indicate the product formed.

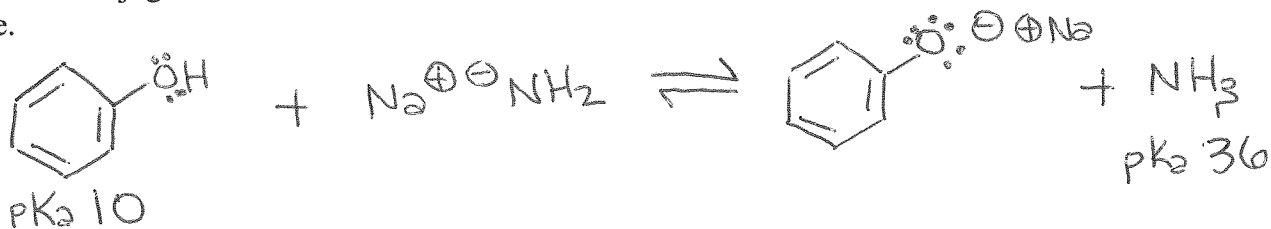


6. Indicate whether each of the following is a Lewis acid or a Bronsted-Lowry acid.



Draw in lone pairs,
Calculate any formal charges

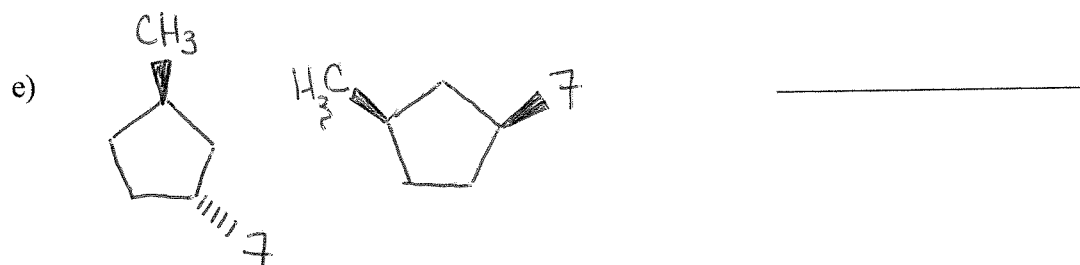
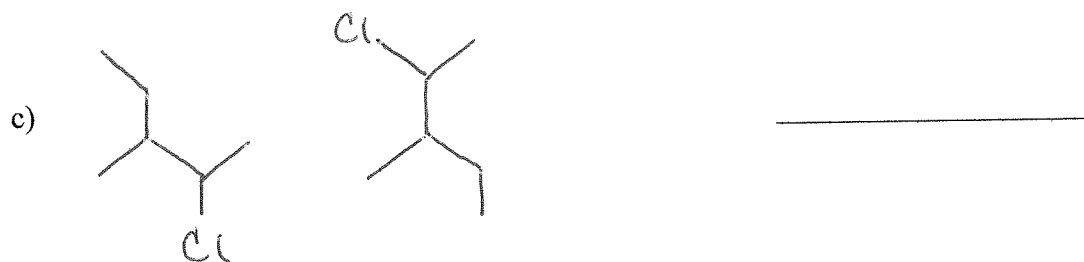
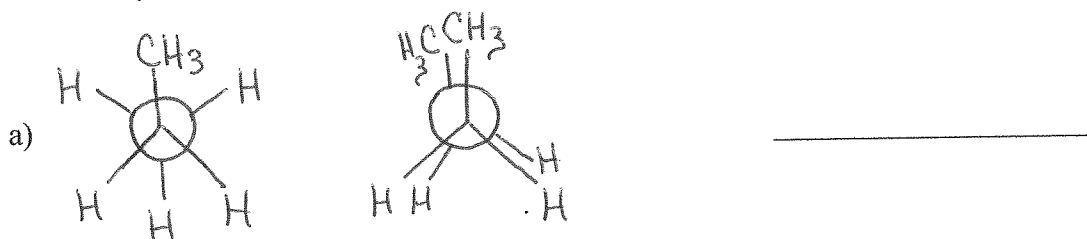
7. Below is an example of an acid/base reaction. Label the acid, the base, the conjugate base and conjugate acid. Indicate in which direction the equilibrium lies by circling that side.



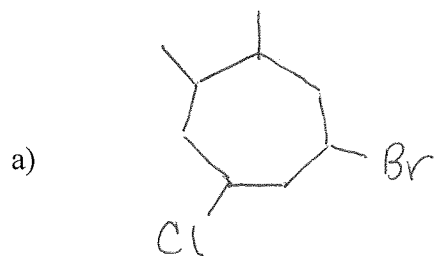
8. Which of the following alkanes has a higher boiling point?



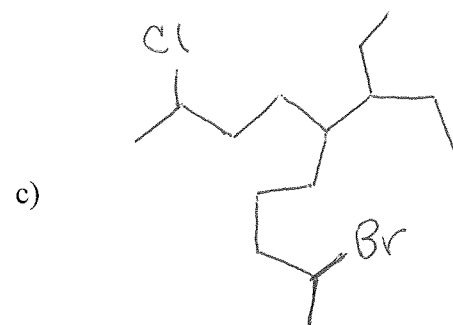
9. Identify the relationship between the following pairs of molecules: are they constitutional isomers, stereoisomers, conformers, resonance structures, the same molecules, or different?

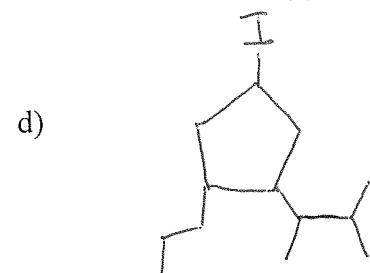


10. Name the following compounds using the IUPAC system:









11. Draw the following compounds:

a) *trans*-1,3-Dichlorocyclooctane

b) 3-Cyclopropylhexane

12. Consider the molecule: 2-Chlorobutane

Sighting along the C2-C3 bond, represent its a) highest energy staggered conformation and b) lowest energy eclipsed conformation with Newman projections.

a)

b)

13. Draw the conformers of *cis*-1-Bromo-2-isopropylcyclohexane and *cis*-1-Bromo-3-isopropylcyclohexane.

Put a "1" by the most stable conformer of the four structures.

Put a "4" by the least stable conformer of the four structures.

Indicate each molecule's most stable conformer by circling it.

At Tuesday's review, I will also incorporate topics covered in class Monday.

GOOD LUCK!!!

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