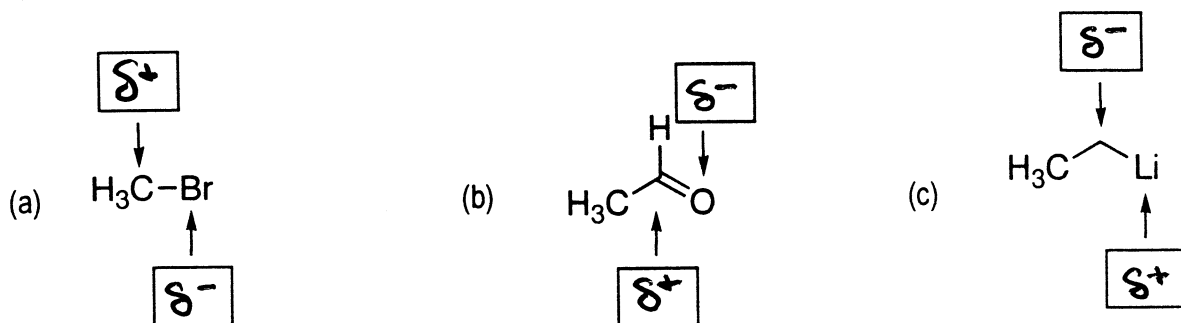
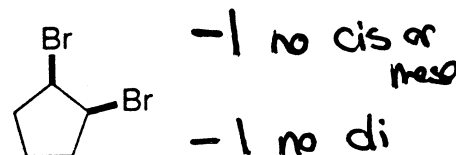
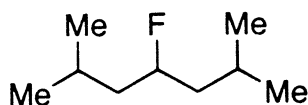


NOTE: STUDENTS PLEASE PICK UP QUIZZES & EXAMS AT CHEM 2120-2122 Hallway

1. Assign partial positive (δ^+) and negative (δ^-) charges to the indicated atoms based on bond polarization. (6 points)

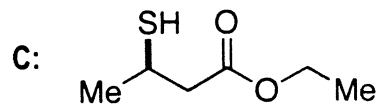
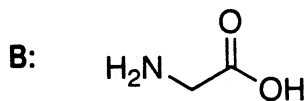
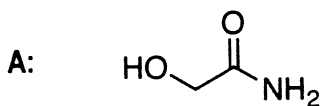


2. Name the following compounds: (6 points)



(a) 2,6-dimethyl-4-fluorooptane (b) cis-1,2-dibromocyclopentane
(meso)

3. Name the functional groups found in each of the following molecules. (6 points)



(a) alcohol

(c) amine

(e) thiol

(b) amide

(d) carboxylic acid

(f) ester

4. Rank the protic acid strength of the molecules shown in question 3, in order of strongest to weakest protic acid. (3 points)

Strongest Protic Acid

B

>

C

>

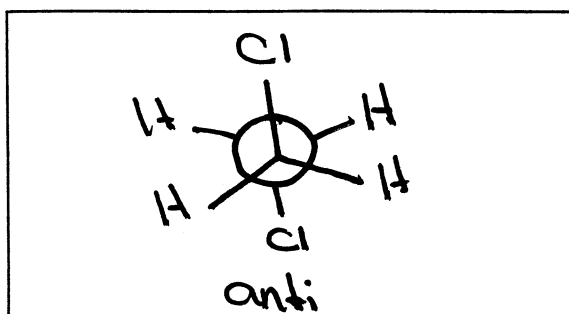
A

Weakest Protic Acid

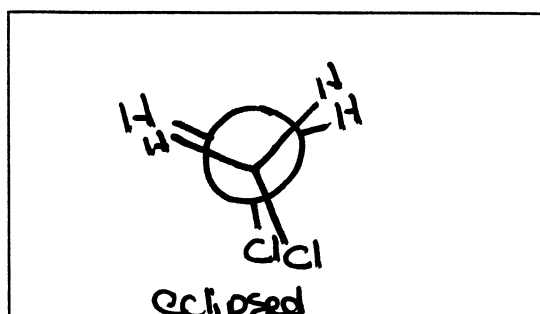
5. Circle molecules that are nucleophiles and draw a square around Lewis Acids. (4 points)



6. Draw Newman projections for the following conformers of 1,2-dichloroethane. (10 points)



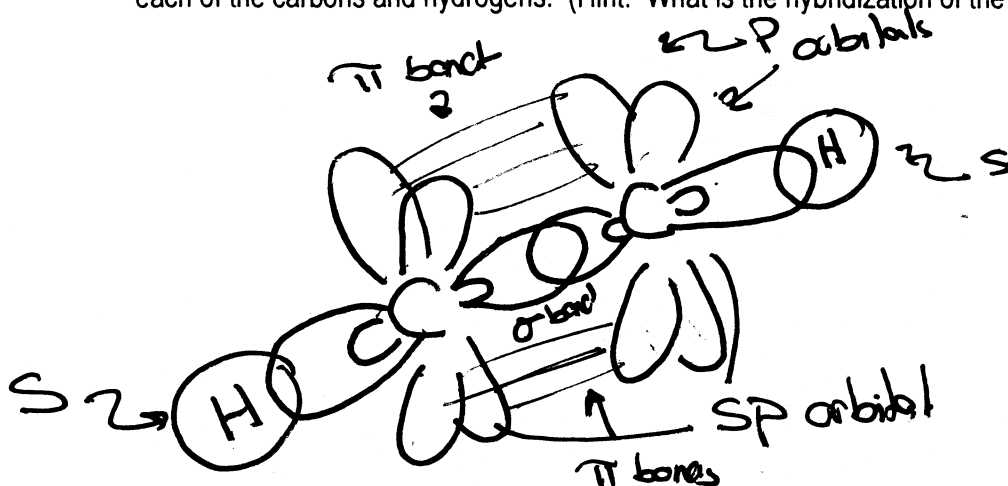
(a) most stable



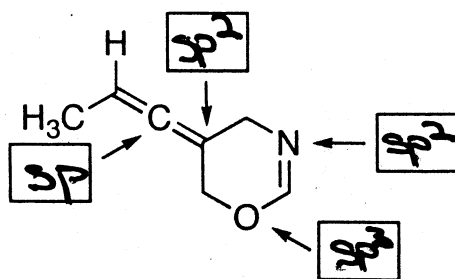
(b) least stable

3pt for grade

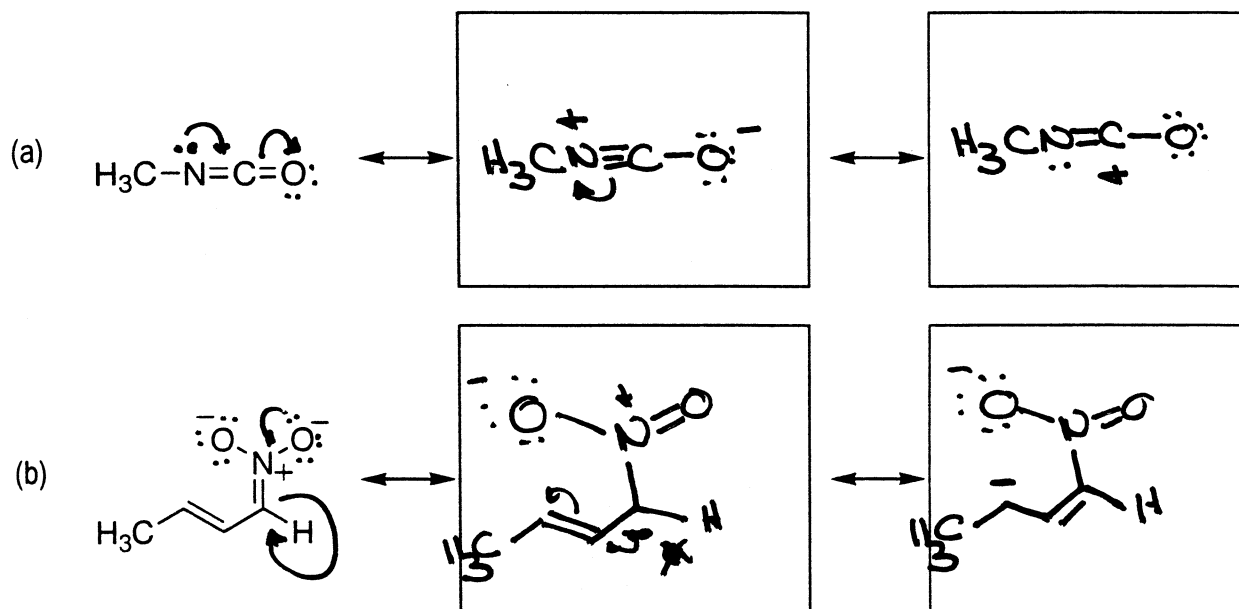
7. Draw the structure of acetylene ($\text{HC}\equiv\text{CH}$). In your structure, draw and label all of the orbitals on each of the carbons and hydrogens. (Hint: What is the hybridization of the carbons?) (6 points)



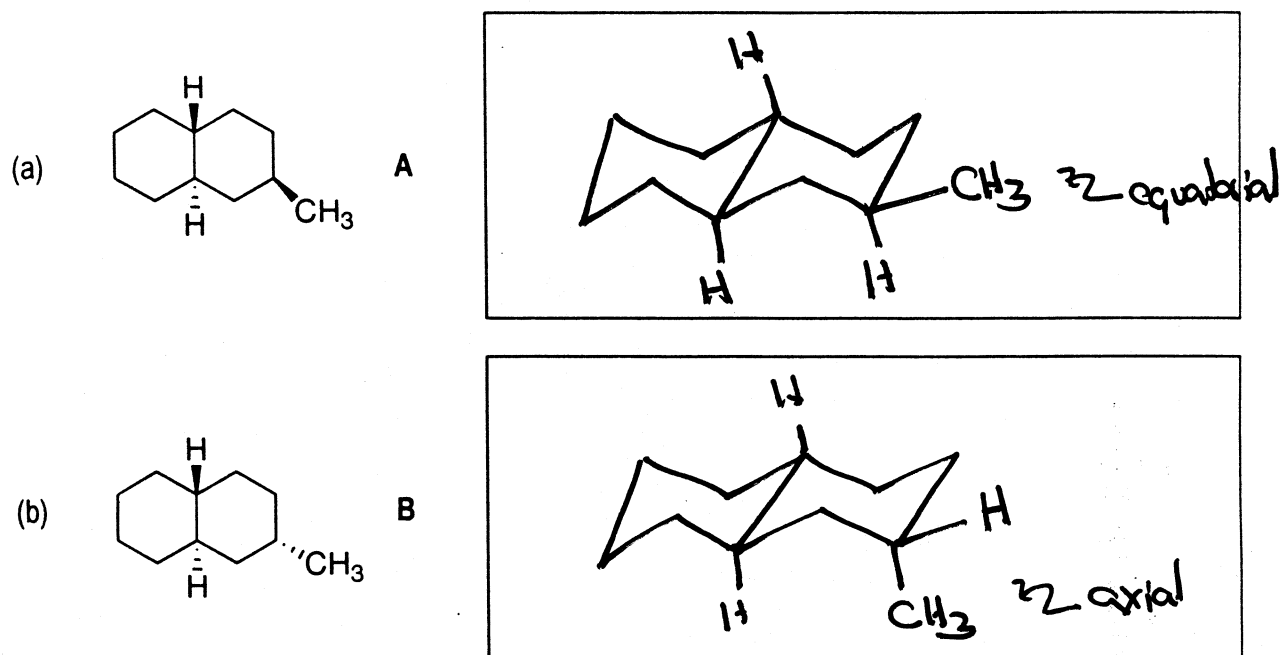
8. Identify the hybridization (sp , sp^3 , etc.) for each of the following atoms (8 points):



9. Draw two resonance structures for the following compound. (Remember: Keep track of the charges!)(12 points)



10. Draw the following decalins in their most stable chair conformations (14 points)

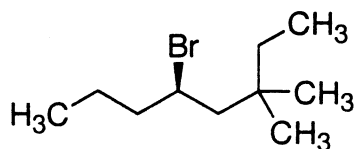


- (c) Which compound is more stable, A or B?

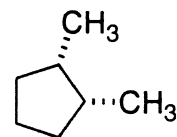
(2 pts)

A

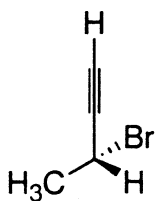
11. Identify the following compounds as (R), (S), meso, or achiral (8 points)



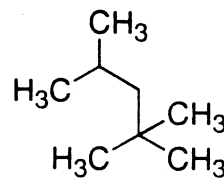
(a) (R)



(b) meso or achiral



(c) (R)



(d) achiral

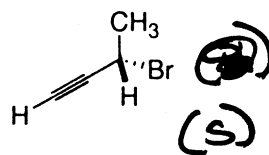
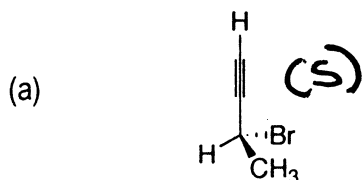
12. Label the relationship between each of the pairs of compounds as one of the following: (10 points)

D: diastereomers

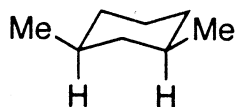
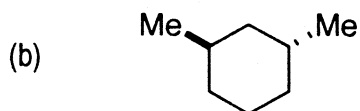
E: enantiomers

CI: constitutional isomers

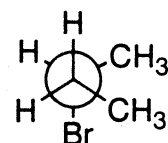
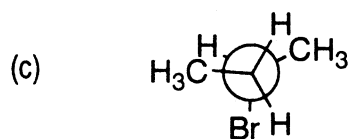
S: same compound



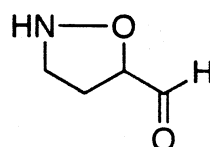
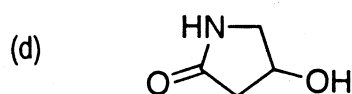
S



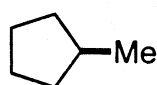
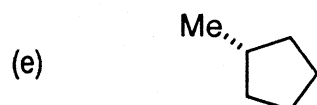
D



S



CI

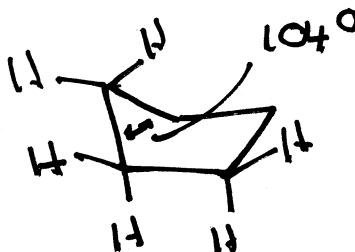


S

13. Planar cyclopentane would have C-C bond angles of 108° , but cyclopentane is **not** planar in its most stable conformation. (10 points)

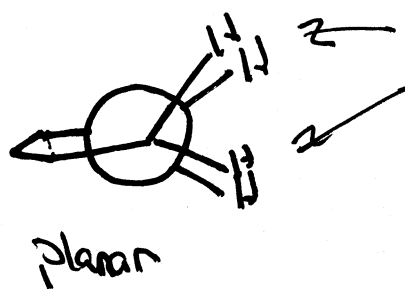
(a) Draw, or described in words, the most stable conformation of cyclopentane. (4 pts)

Envelope Conformation with bond angles of $\sim 104^\circ$



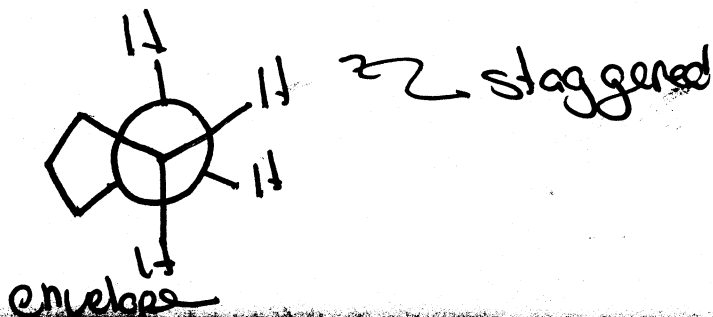
(b) Explain, using Newman projections, why cyclopentane is not planar. (6 pts)

Planar cyclopentane would be all eclipsed:



(higher energy)
& strained

envelope cyclopentane has staggered C-C bonds:



(lower energy)