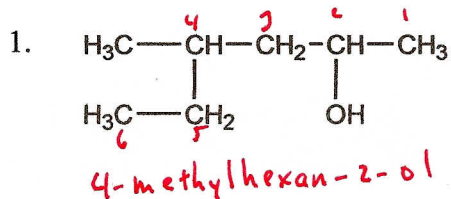


CHEM3411 spring 2009 test 1 Name: Key

I. Give the complete structure for each name. Give the IUPAC name for each structure. 5pts ea, 20 pts tot



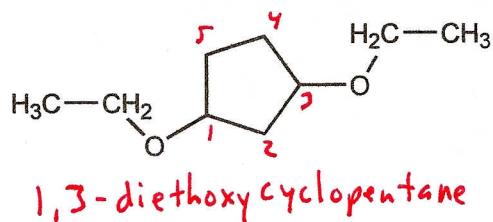
2. N-ethylcyclobutanamine



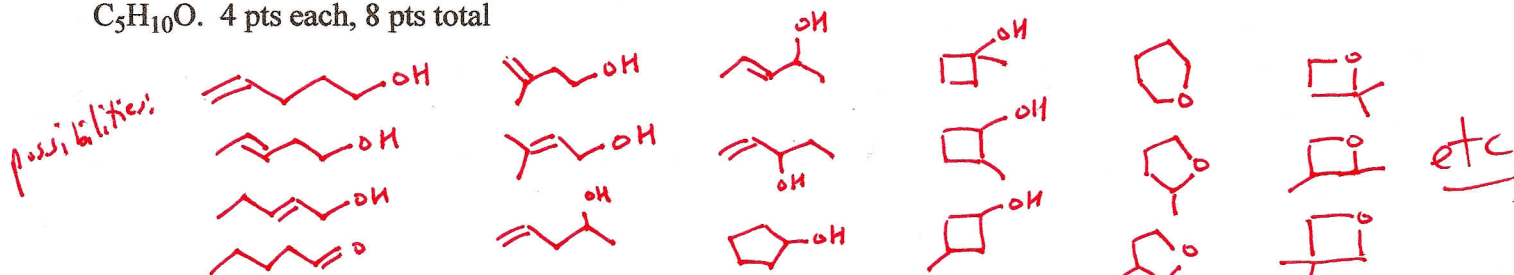
3. bicyclo[3.3.0]octane



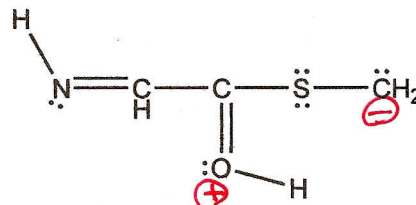
4.



II. Draw complete Kekule/Lewis structures for 2 different stable compounds that each have the formula $\text{C}_5\text{H}_{10}\text{O}$. 4 pts each, 8 pts total



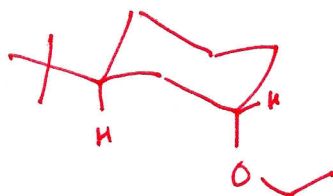
III. Consider the structure shown where all atoms, bonds, and lone pairs are drawn. Write the correct formal charge on each atom whose formal charge is not zero. 7 pts



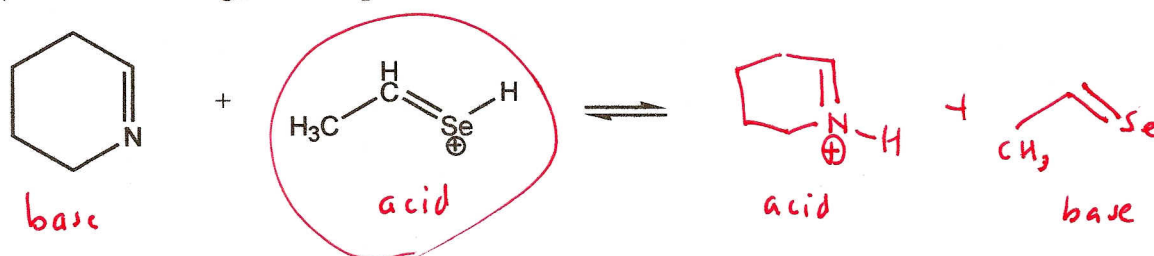
IV. Curved arrow formalism is shown for a process. Draw the result of the process that is indicated by the curved arrows. 5 pts



V. Draw the most stable chair conformation of trans-1-tert-butyl-3-ethoxycyclohexane. 6 pts

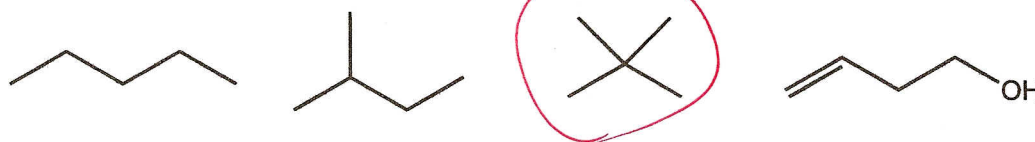


- VI. (a) Complete the acid-base reaction shown. 4 pts
 (b) Label each acid and base on both the product and reactant sides. 2 pts
 (c) Circle the stronger acid. 3 pts



- VII. Circle the best response for each question. Best 9 count 5 pts each, 45 pts total, try all for bonus.

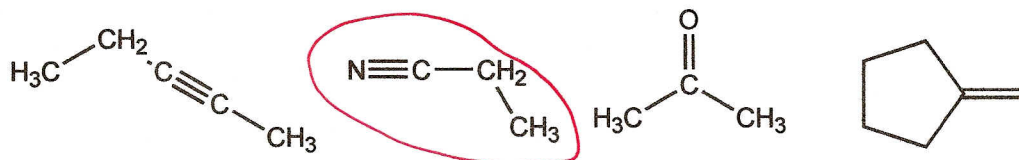
1. Which compound will have the largest peak in the mass spectrum at m/z 57?



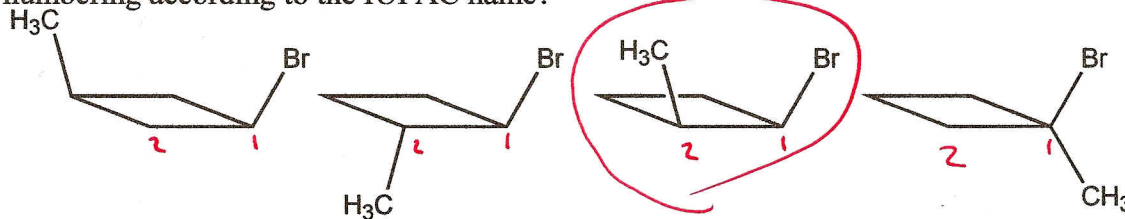
2. Circle the strongest base.



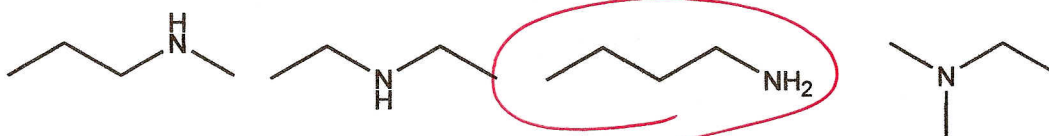
3. Which compound will have the largest peak between 2000 and 2400 cm^{-1} in the infrared spectrum?



4. Which compound will have the largest bond angle between Br, carbon 1, and carbon 2 with numbering according to the IUPAC name?



5. Which compound has the highest boiling point?



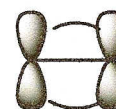
6. What is the best description of the the overlapping p-orbitals shown:

sigma bond

alpha bond

pi bond (circled)

hybrid bond



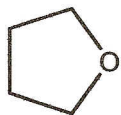
7. A simple distillation is performed on a 50:50 mix of A and B (shown).
What is the best description of the the likely outcome?



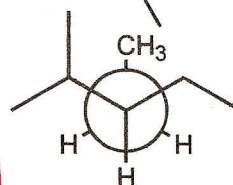
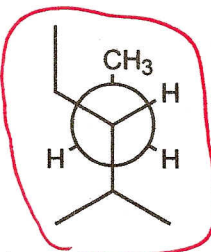
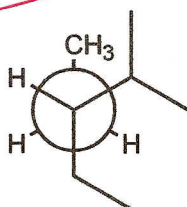
Pure A is collected followed by pure B
Pure B is collected followed by pure A

Impure yet predominantly A is collected first that gradually becomes less pure
Impure yet predominantly B is collected first that gradually becomes less pure
Impure yet predominantly A is collected first that gradually becomes more pure
Impure yet predominantly B is collected first that gradually becomes more pure

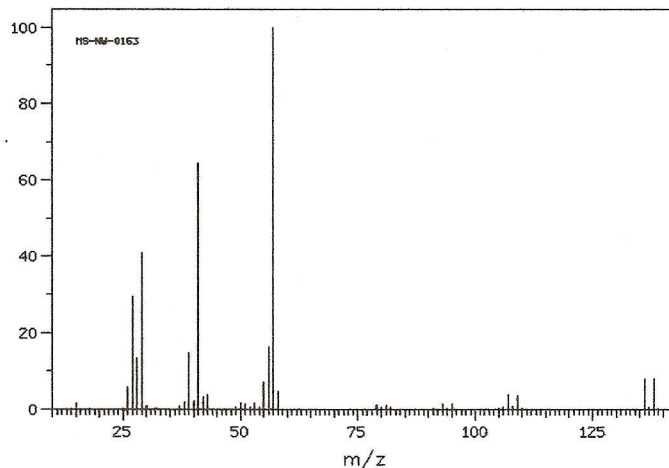
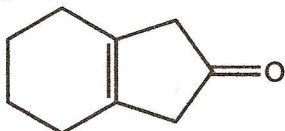
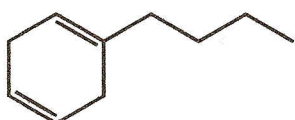
8. Which compound has the greatest solubility in water?



9. Which is most stable?



10. Which is the most likely structure that matches the mass spectrum shown?



11. Which is the most likely structure for the infrared spectrum shown?

