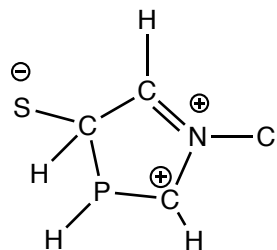


Organic Chemistry I for the Life Sciences
CHM 223
Test 1
Chapters 1-4

Name _____

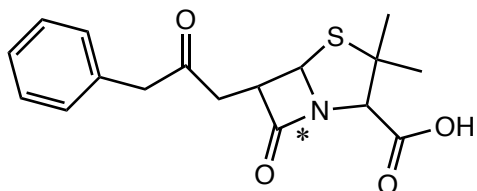
1. Draw a complete Lewis dot structure for F^{+2} :

2. Draw in missing lone pairs for the following molecule:



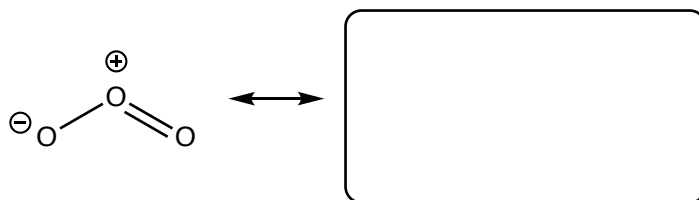
3. What is the expected hybridization of the nitrogen atom in a molecule of HNO ? Provide supporting evidence for your answer.

4. Answer the following questions based on the skeletal (bond-line) structure of penicillin G provided below.



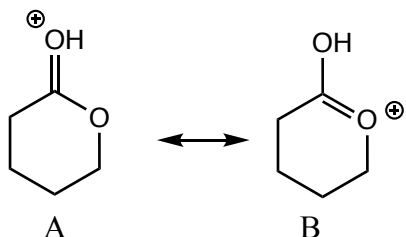
1. How many total pi bonds total are present?
2. How many total SP^2 atoms are present?
3. The bond marked with a * is formed by overlap of which types of hybridized orbitals?

5. Using curved arrows properly, draw the other important resonance form for ozone.



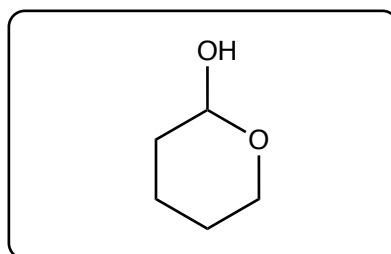
resonance form

6. Two resonance forms for a structure are provided below. Using the template provided, draw the expected hybrid form for this compound that clearly shows expected charges on charged atoms, and bond orders where appropriate



A

B



hybrid form

7. Which of the following bonds places a partial *positive* charge on the carbon atom (may be more than one answer)?

A. C–F

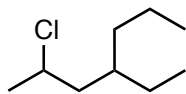
B. C–B

C. C–O

D. C–Si

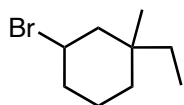
8. Draw a good Lewis dot structure for methyl isocyanide, H_3CNC (the C,N,C atoms are connected in the order as provided).

9. Provide the IUPAC name for the following molecule:



10. Draw the skeletal (bond line) structure for 2,4-dibromo-5-isopropyloctane

11. Provide the IUPAC name for the following molecule:



12. Clearly draw the structure of cis-1-isopropyl-3-methylcyclopentane

13. What is the relationship between the following two compounds?

cis-1,2-dibromocycloheptane *and* trans-1,3-dibromocycloheptane

A. identical

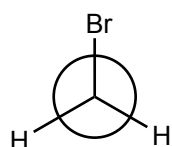
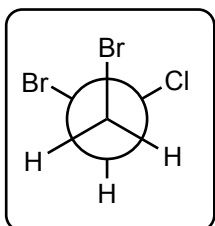
B. stereoisomers

C. no relationship

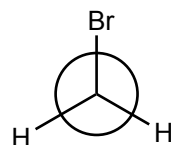
D. constitutional isomers

E. BFFs

14. The following Newman projection is that for one conformation of 1,2-dibromo-2-chloroethane. Using the templates below, draw Newman projections corresponding to its **highest** energy conformation and **lowest** energy conformation.



highest energy

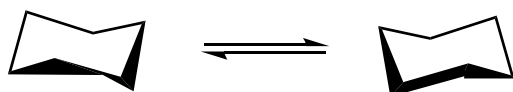


lowest energy

15. The type of strain experienced by a substituent in the axial position of a cyclohexane chair conformation is primarily that of:

- A. torsional strain B. angle strain C. chair-chair strain D. steric strain E. back strain

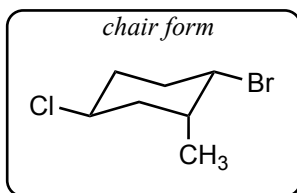
16. **Clearly** draw the two chair forms for cis-1-ethyl-2-isopropylcyclohexane. Which of the two chair conformations drawn, A or B, is most stable? Briefly explain.



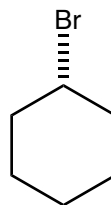
A

B

17. The molecule below is drawn in its chair form. Complete the structure of this molecule drawn in the planar form that clearly shows the stereochemical relationships of the substituents:



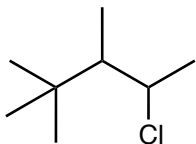
planar form



18. Which one of the following statements is true about the bent conformation of cyclobutane relative to the hypothetical planar form?

- A. The bent conformation is more stable even though the angle strain is greater than in the planar conformation
 B. The planar conformation is more stable even though the angle strain is greater than in the bent conformation
 C. The bent conformation is more stable even though the torsional strain is greater than in the planar conformation
 D. The planar conformation is more stable even though the torsional strain is greater than in the bent conformation

19. Provide answers for the questions about the structure below



A. How many 1° hydrogen atoms are present?

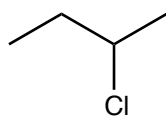
B. How many 2° carbon atoms are present?

C. How many 4° carbon atoms are present?

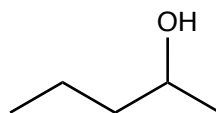
20. Which of the following properly ranks the boiling points of compounds A-D below (all four compounds have approximately the same molecular weight):



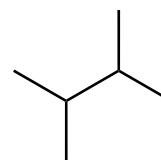
A



B



C



D

- A. $D > A > C > B$
- B. $C > A > B > D$
- C. $B > D > C > A$
- D. $C > B > A > D$
- E. $A > D > C > B$