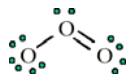


CHM 11 Exam 3 Fall 2007 Section D01BG

You have 2 hours to complete this exam. Be sure to answer each question with as much detail as is possible and reasonable. Each question is equally valued.

1. An atom has 21 electrons. Write the electron configuration (spdf) and indicate how many unpaired electrons the atom has.
2. Arrange the following atoms in order of decreasing radius: Si, Na, Mg.
3. Select the larger ion in the pair: Na^+ vs. K^+
4. Select the larger ion in the pair: Cu^{2+} vs. Cu^+
5. Select the larger ion in the pair: C^{4-} vs. Si^{4-}
5. Which atom should have a larger first ionization energy: C or Si?
6. Which atom should have a larger second ionization energy: K or Ca?
7. Explain whether Cl forms Cl^- or Cl^{2-} .
8. Write the Lewis structure for silicon disulfide (SiS_2).
9. Write the Lewis structure for sulfite (SO_3^{2-}).

10. Calculate the formal charges for each atom in ozone (O_3). The Lewis structure for ozone is:



11. Draw the Lewis structure for sulfur tetrafluoride (SF_4).

12. Use the VSEPR model to predict the geometry of $SiCl_4$.

13. Use the VSEPR model to predict the geometry of CS_2 .

14. Which bond should be more polar: C-O vs. Si-O.

15. Determine the hybridization state of the underlined atom in $\underline{C}H_3Cl$.

16. Determine the hybridization state of the underlined atom in $H_2\underline{C}=CH_2$.

17. How many sigma (σ) bonds and pi (π) bonds are in HCN? Assume that N is sp -hybridized.

18. Consider the energy level diagram for F_2 . What is the bond order of F^+ ?

