

Chem 1A Exam 5 S14
(Chapter 6, 7, 8, 9)

Name _____

1. Give the full electronic configuration of silicon. Circle the valence electrons.
2. Give the noble configuration of copper.
3. Give the noble orbital diagram of copper (I). Label as paramagnetic or diamagnetic.
4. Put the following in order of decreasing size: Mg^{2+} , O , O^{2-} , Ca , Ni , K
5. Does Electronegativity increase or decrease from left to right? Explain.
6. Does Electronegativity increase or decrease from top to bottom? Explain.
7. What atoms can have an expanded octet? Why?

8. Draw the lewis structure of the nitrate polyatomic anion and any resonance forms. Indicate the bond order of the nitrogen/oxygen bond.

9. Draw the best lewis structure of chlorate, ClO_3^- . Indicate the formal charges on every atom. Indicate why it is the best structure.

10. Draw the lewis structure for the following and complete the following questions.

a. PCl_4^+

- i. E-geometry
- ii. Molecular geometry
- iii. Hybridization of central
- iv. Polarity of P/Cl bond (also show calc)?
- v. Polarity of molecule?

b. CF_2O

- i. E-geometry
- ii. Molecular geometry
- iii. Hybridization of central
- iv. Polarity of C/O bond (also show calc)?
- v. Polarity of C/F bond (also show calc)?
- vi. Polarity of molecule?

c. SBr_6

- i. E-geometry
- ii. Molecular geometry
- iii. Hybridization of central
- iv. Polarity of S/Br bond (also show calc)?
- v. Polarity of molecule?

d. NO_2^-

- i. E-geometry
- ii. Molecular geometry
- iii. Hybridization of central
- iv. Polarity of N/O bond (also show calc)?
- v. Polarity of molecule?

e. HCCH

- i. E-geometry
- ii. Molecular geometry
- iii. Hybridization of central
- iv. Polarity of C/H bond (also show calc)?
- v. Polarity of molecule?

11. Complete the following molecular orbital diagrams for N_2^- and N_2^{2-} and then answer the questions. (diagram handed out separately)

- a. What is the bond order of N_2^- ? Show calc.
- b. What is the bond order of N_2^{2-} ? Show calc.
- c. Which molecule has the weakest bond?
- d. Which molecule has the shortest bond?
- e. Are any molecules paramagnetic? If so, indicate which one.