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\(^+\) vs. Si\(^+\)

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 (O₃). The Lewis structure for ozone is:

11. Draw the Lewis structure for sulfur tetrafluoride (SF₄).

12. Use the VSEPR model to predict the geometry of SiCl₄.

13. Use the VSEPR model to predict the geometry of CS₂.

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

15. Determine the hybridization state of the underlined atom in CH₃Cl.

16. Determine the hybridization state of the underlined atom in H₂C=CH₂.

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 F₂. What is the bond order of F⁺?

\[ \sigma_{2px}, \pi_{2py}^*, \pi_{2pz}^* \]

\[ \pi_{2py}, \pi_{2pz} \]

\[ \sigma_{2px}, \sigma_{2s} \]

\[ \sigma_{2s}^* \]