

2.
 - a. (5) Write an expanded (not abbreviated) ground state configuration of Si

 - b. (5) Draw an orbital diagram for this atom

 - c. (5) Is Si diamagnetic or paramagnetic?

3.
 - a. (5) Predict the electron configuration of Technetium (Tc) from the periodic table (write using a noble gas core).

 - b. (5) What is the electron configuration of Tc^{2+} ?

 - c. (5) Which one is larger in size, Tc or Tc^{2+} ?

4. a. (5) Write Sc, Sr, and Sc^{3+} in order of increasing atomic radius

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- b. (5) Write Al, P, and In in order of increasing ionization energy

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- c. (5) Write the bonds C-----O, C===O, Si-----O in order of increasing bond energy

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5. a. (10) Draw a Lewis structure for the nitrite ion (NO_2^-)

- b. (5) What is the shape of this ion (tetrahedral, linear, trigonal, etc) and the O-N-O bond angle?

6. (10) The Pauling electronegativity values for C, and Cl are 2.6, and 3.2, respectively.

- a. (3) What is the shape of the molecule CCl_4 ?

b. (4) Draw this molecule along with the individual bond dipole moments using the crossed arrow notation.

c. (3) Is this molecule polar or nonpolar ?

7. (10) 0.270 g of dry oxalic acid ($\text{H}_2\text{C}_2\text{O}_4$) was dissolved in water and titrated with NaOH solution. It took 48.7 ml of NaOH to reach the endpoint. What is the molarity of the NaOH solution?

