

Unit 2 – Chapters 8,9: Bonding & Hybridization

Name _____

Assignment #4: VSEPR & Hybridizations

Period _____

- 1) Which of the following statements is/are true? **Correct the false statements.**
 - a. The molecules SeS_3 , SeS_2 , PCl_5 , TeCl_4 , ICl_3 , and XeCl_2 all exhibit at least one bond angle which is approximately 120° .
 - b. The bond angle in SO_2 should be similar to the bond angle in CS_2 or SCl_2 .
 - c. Of the compounds CF_4 , KrF_4 , and SeF_4 , only SeF_4 exhibits an overall dipole moment (is polar).
 - d. Central atoms in a molecule adopt a geometry of the bonded atoms and lone pairs about the central atom in order to maximize electron repulsions.

- 2) Write electron configurations for
 - a. The cations Mg^{2+} , K^+ , and Al^{3+}
 - b. The anions N^{3-} , O^{2-} , F^- , and Te^{2-}

- 3) Give the hybridization of the central atom in each species below
 - a. ClF_2^-
 - b. SeF_5Br
 - c. SO_3^{2-}
 - d. BrO_2^-

- 4) What is the hybridization of carbon in:
 - a. CH_3Cl

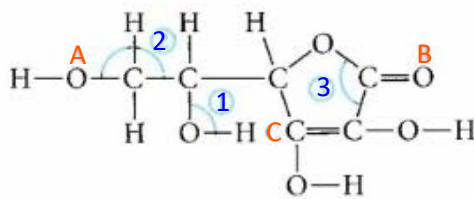
 - b. $\left[\begin{array}{c} \text{O} - \text{C} - \text{O} \\ || \\ \text{O} \end{array} \right]^{2-}$

 - c. $\text{O}=\text{C}=\text{O}$

 - d. $\begin{array}{c} \text{H} - \text{C} - \text{OH} \\ || \\ \text{O} \end{array}$

5) Give the number of sigma and pi bonds in each species in question #4.

6) Consider vitamin C. Its skeleton structure is



- How many sigma and pi bonds are there in vitamin C?
- How many unshared electron pairs are there?
- What are the approximate values of the angles marked (in blue) 1, 2, and 3?
- What is the hybridization of each atom marked (in red) A, B, and C?