

CHAPTER 9- PROBLEM SET

1. Give the electron-domain and molecular geometries for the following molecules and ions: (a) HCN, (b) SO_3^{2-} , (c) SF_4 , (d) PF_6^- , (e) NH_3Cl^+ , (f) N_3^- .
2. Predict whether each of the following molecules is polar or nonpolar: (a) IF, (b) CS_2 , (c) SO_3 , (d) PCl_3 , (e) SF_6 , (f) IF_5 .
3. (a) Draw Lewis structures for ethane (C_2H_6), ethylene (C_2H_4), and acetylene (C_2H_2). (b) What is the hybridization of the carbon atoms in each molecule? (c) Predict which molecules, if any, are planar. (d) How many s and p bonds are there in each molecule?
4. What hybridization do you expect for the atom indicated in red in each of the following species? (a) $\text{CH}_3\text{C}^{\text{red}}\text{O}_2^-$; (b) $\text{P}^{\text{red}}\text{H}_4^+$; (c) $\text{A}^{\text{red}}\text{IF}_3$; (d) $\text{H}_2\text{C}=\text{CH}-\text{C}^{\text{red}}\text{H}_2^+$.