

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Period: \_\_\_\_\_

## AP Chemistry Chapter 8 Essentials Pt II

### MOLECULAR GEOMETRIES

Given the 2 examples of each geometry type, draw the model of each indicating bond angles, hybridization, polarity, and whether the octet rule is satisfied.

1. Linear: XeF<sub>2</sub> and CO<sub>2</sub>
2. Trigonal Planar: CH<sub>2</sub>O and BCl<sub>3</sub>
3. Tetrahedral: SiH<sub>4</sub> and CCl<sub>4</sub>
4. Trigonal pyramidal (AB<sub>3</sub>U Species): NH<sub>3</sub> and SO<sub>3</sub><sup>2-</sup>
5. Bent/Angular (AB<sub>2</sub>U<sub>2</sub> Species): H<sub>2</sub>S and NH<sub>2</sub><sup>1-</sup>
6. Trigonal Bipyramidal (AB<sub>5</sub> Species): SbCl<sub>5</sub> and PF<sub>5</sub>
7. Octahedral (AB<sub>6</sub> Species): PF<sub>6</sub><sup>1-</sup> and SF<sub>6</sub>

### VARIATIONS BETWEEN SIMILAR SPECIES

8. How many actual "electronic" geometries are there?
9. Explain the similarities and differences between  $\text{CH}_4$ ,  $\text{H}_2\text{O}$  and  $\text{NH}_3$ .
10. Explain the similarities and differences between  $\text{AB}_4\text{U}$ ,  $\text{AB}_3\text{U}_2$ ,  $\text{AB}_2\text{U}_3$  species.
11. Explain the similarities and differences between  $\text{AB}_5\text{U}$  and  $\text{AB}_4\text{U}_2$  species.

### DOUBLE AND TRIPLE BONDS

12. What is the difference between a sigma and pi bond?
13. What type of hybridization and how many sigma and pi bonds are in a  $\text{C}_2\text{H}_4$  molecule? Draw an example of this molecule.
14. What type of hybridization and how many sigma and pi bonds are in a  $\text{C}_2\text{H}_2$  molecule? Draw an example of this molecule.