

Chemistry CP

Name: _____

Review Sheet: Lewis Structures and VSEPR Theory

Section: _____

After completing this unit, you should be able to:

- Infer the number of valence electrons in an atom of a main-group element, and then construct its Lewis dot structure.
- State the octet rule.
- List the characteristics of a covalent bond.
- Create Lewis structures for covalent compounds containing single, double, and triple bonds.
- Describe the shapes of simple covalently bonded molecules using VSEPR theory.
- Use the bond types and geometry of molecules to determine molecular polarity.

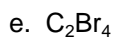
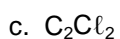
Problems for you to try:

1. Explain what is meant by the term "chemical bond."
2. What is the difference between a polar bond and a nonpolar bond? (p. 162)
3. Explain how you can use the periodic table to predict relative polarity of bonds. For example, how do you know by looking at the periodic table that a C-O bond is more polar than an N-O bond?
4. State the octet rule. (p. 169)
5. What is the main idea in VSEPR theory?
6. Why must a Lewis structure for a molecule be drawn before we can determine its geometry?

7. According to the VSEPR model, the arrangements of electron pairs around NH_3 and CH_4 ___
- a. are different because there is a different number of atoms around the central atom.
 - b. are different because there is a different number of electron pairs around the central atom.
 - c. are the same because both nitrogen and carbon are in the second period.
 - d. are the same because there is the same number of electron pairs around the central atom.
 - e. Both a and b are correct.

Provide support for your answer.

8. Draw Lewis structures for the following covalent compounds. Be sure to include all the lone pairs present in the molecule. List the number of electron domains around each central atom.
(pp. 170-174)



Identify the following shapes of molecules. (pp. 183-185) Label bond angles.

a) _____

b) _____

c) _____

d) _____

e) _____

f) _____

g) _____

h) _____

Will the following molecules be polar or nonpolar? Consider the arrangements of the bond dipoles!