

Chapter 8 Problems

Matching

Match each item with the correct statement below.

- | | |
|-----------------------------|-------------------------|
| a. coordinate covalent bond | d. single covalent bond |
| b. double covalent bond | e. polar bond |
| c. structural formula | f. hydrogen bond |

- _____ 1. a depiction of the arrangement of atoms in molecules and polyatomic ions
- _____ 2. a covalent bond in which only one pair of electrons is shared
- _____ 3. a covalent bond in which two pairs of electrons are shared
- _____ 4. a covalent bond in which the shared electron pair comes from only one of the atoms
- _____ 5. a covalent bond between two atoms of significantly different electronegativities
- _____ 6. a type of bond that is very important in determining the properties of water and of important biological molecules such as proteins and DNA

Match each item with the correct statement below.

- | | |
|-----------------------------|----------------------|
| a. network solid | e. tetrahedral angle |
| b. bonding orbital | f. VSEPR theory |
| c. dipole interaction | g. sigma bond |
| d. bond dissociation energy | |

- _____ 7. energy needed to break a single bond between two covalently bonded atoms
- _____ 8. symmetrical bond along the axis between the two nuclei
- _____ 9. molecular orbital that can be occupied by two electrons of a covalent bond
- _____ 10. 109.5°
- _____ 11. shapes adjust so valence-electron pairs are as far apart as possible
- _____ 12. attraction between polar molecules
- _____ 13. crystal in which all the atoms are covalently bonded to each other

Numeric Response

14. How many valence electrons does an iodine atom have?

Name: _____

ID: A

15. What is the total number of covalent bonds normally associated with a single carbon atom in a compound?

16. How many electrons are shared in a single covalent bond?

17. How many electrons does a nitrogen atom need to gain in order to attain a noble-gas electron configuration?

18. How many unshared pairs of electrons does the nitrogen atom in ammonia possess?

19. How many electrons does carbon need to gain in order to obtain a noble-gas electron configuration?

20. How many electrons are shared in a double covalent bond?

21. How many covalent bonds are in a covalently bonded molecule containing 1 phosphorus atom and 3 chlorine atoms?

22. How many unshared pairs of electrons are in a molecule of hydrogen iodide?

23. What is the bond angle in a water molecule?