Name _____ Date _____ Class _____

CHAPTER 9 STUDY GUIDE FOR CONTENT MASTERY

Section 9.5 Electronegativity and Polarity

In your textbook, read about electronegativity.

Use the table of electronegativities below to answer the following questions.

Electronegativities of Some Elements

1 H 2.20																	
3 Li 0.98	4 Be 1.57											5 B 2.04	6 C 2.55	7 N 3.04	8 O 3.44	9 F 3.98	
11 Na 0.93	12 Mg 1.31											13 Al 1.61	14 Si 1.90	15 P 2.19	16 S 2.58	17 Cl 3.16	
19 K 0.82	20 Ca 1.00	21 Sc 1.36	22 Ti 1.54	23 V 1.63	24 Cr 1.66	25 Mn 1.55	26 Fe 1.83	27 Co 1.88	28 Ni 1.91	29 Cu 1.90	30 Zn 1.65	31 Ga 1.81	32 Ge 2.01	33 As 2.18	34 Se 2.55	35 Br 2.96	
37 Rb 0.82	38 Sr 0.95	39 Y 1.22	40 Zr 1.33	41 Nb 1.6	42 Mo 2.16	43 Tc 2.10	44 Ru 2.2	45 Rh 2.28	46 Pd 2.20	47 Ag 1.93	48 Cd 1.69	49 In 1.78	50 Sn 1.96	51 Sb 2.05	52 Te 2.1	53 I 2.66	
55 Cs 0.79	56 Ba 0.89	57 La 1.10	72 Hf 1.3	73 Ta 1.5	74 W 1.7	75 Re 1.9	76 Os 2.2	77 Ir 2.2	78 Pt 2.2	79 Au 2.4	80 Hg 1.9	81 Tl 1.8	82 Pb 1.8	83 Bi 1.9	84 Po 2.0	85 At 2.2	
87 Fr 0.7	88 Ra 0.9	89 Ac 1.1															

Metal
Metalloid
Nonmetal

1. What is the meaning of the term *electronegativity*?
   the tendency of an atom to attract electrons

2. Which element has the highest electronegativity? What is the numerical value? What are the name and group number of the chemical family that has the highest overall electronegativities?
   fluorine; 3.98; halogens; group 7A

3. Which element has the lowest electronegativity? What is the numerical value? What are the name and group number of the chemical family that has the lowest overall electronegativities?
   francium; 0.7; alkali metals; group 1A

4. What general trend in electronegativity do you note going down a group? Across a period?
   Electronegativity tends to decrease. Electronegativity tends to increase.

5. How are the electronegativity values used to determine the type of bond that exists between two atoms?
   The values are subtracted.

In your textbook, read about the properties of covalent compounds.

For each statement below, write *true* or *false*.

true 6. Ionic compounds are usually soluble in polar substances.

false 7. In a covalent molecular compound, the attraction between molecules tends to be strong.

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CHAPTER 9 STUDY GUIDE FOR CONTENT MASTERY

Section 9.5 *continued*

In your textbook, read about bond polarity.

Using the table of electronegativities on the preceding page, circle the letter of the choice that best completes the statement or answers the question.

8. Unequal sharing of electrons between two bonded atoms always indicates
   a. a nonpolar covalent bond. (c.) a polar covalent bond.
   b. an ionic bond. d. a polar molecule.

9. When electronegativities of two bonded atoms differ greatly, the bond is
   a. polar covalent. b. coordinate covalent. c. polar covalent. (d.) ionic.

10. What is the electronegativity difference that usually is the dividing line between covalent and ionic bonds?
    a. 1.0 (b.) 1.7 c. 2.7 d. 4.0

11. The symbol δ^+ is placed next to which of the following?
    (a.) the less electronegative atom in a polar covalent bond c. a positive ion
    b. the more electronegative atom in a polar covalent bond d. the nucleus

12. A nonpolar covalent bond is one in which
    a. electrons are transferred. (c.) electrons are shared equally.
    b. electrons are shared unequally. d. both electrons are provided by the same atom.

13. Molecules containing only polar covalent bonds
    a. are always polar. c. are always ionic.
    (b.) may or may not be polar. d. are always nonpolar.

14. What factor other than electronegativity determines whether a molecule as a whole is polar or not?
    a. temperature (b.) its geometry c. its physical state d. its mass

15. Which of the following correctly describes the compound water, H_2O?
    a. ionic c. polar overall, with nonpolar covalent bonds
    b. nonpolar overall, with polar covalent bonds (d.) polar overall, with polar covalent bonds

16. Which of the following correctly describes the compound carbon tetrachloride, CCl_4?
    a. ionic c. polar overall, with nonpolar covalent bonds
    (b.) nonpolar overall, with polar covalent bonds d. polar overall, with polar covalent bonds

17. A molecule of ammonia, NH_3, is
    a. nonpolar because it is linear.
    b. polar because it is linear.
    c. nonpolar because there is no electronegativity difference.
    (d.) polar because there is an electronegativity difference and the molecule is trigonal pyramidal.

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