Name _____ **Honors Chemistry** **___/___/___**

Covalent Compounds Practice Test

Part I: For each of the following, determine the missing information.

Name	Lewis Structure	Shape	Bond Polarity	Molecular Polarity
silicon dioxide				
Formula		Hybridization of Central Atom	# sigma bonds	# pi bonds

Name	Lewis Structure	Shape	Bond Polarity	Molecular Polarity
ammonia				
Formula		Hybridization of Central Atom	# sigma bonds	# pi bonds

Name	Lewis Structure	Shape	Bond Polarity	Molecular Polarity
methane				
Formula		Hybridization of Central Atom	# sigma bonds	# pi bonds

Name	Lewis Structure	Shape	Bond Polarity	Molecular Polarity
sulfur trioxide				
Formula		Hybridization of Central Atom	# sigma bonds	# pi bonds

Name	Lewis Structure	Shape	Bond Polarity	Molecular Polarity
nitrate ion				
Formula		Hybridization of Central Atom	# sigma bonds	# pi bonds

Name	Lewis Structure	Shape	Bond Polarity	Molecular Polarity
phosphorus pentachloride				
Formula		Hybridization of Central Atom	# sigma bonds	# pi bonds

Name	Lewis Structure	Shape	Bond Polarity	Molecular Polarity
chlorine trifluoride				
Formula		Hybridization of Central Atom	# sigma bonds	# pi bonds
Name	Lewis Structure	Shape	Bond Polarity	Molecular Polarity
dihydrogen monoxide				
Formula		Hybridization of Central Atom	# sigma bonds	# pi bonds
Name	Lewis Structure	Shape	Bond Polarity	Molecular Polarity
beryllium dichloride				
Formula		Hybridization of Central Atom	# sigma bonds	# pi bonds
Name	Lewis Structure	Shape	Bond Polarity	Molecular Polarity
bromine pentafluoride				
Formula		Hybridization of Central Atom	# sigma bonds	# pi bonds
Name	Lewis Structure	Shape	Bond Polarity	Molecular Polarity
boron trichloride				
Formula		Hybridization of Central Atom	# sigma bonds	# pi bonds
Name	Lewis Structure	Shape	Bond Polarity	Molecular Polarity
sulfur tetrafluoride				
Formula		Hybridization of Central Atom	# sigma bonds	# pi bonds

Part II - Draw all resonance structures for carbonate ion.

Part III - For each of the following, indicate if it is a property of **ionic compounds** or **covalent compounds**.

1. _____ They have high melting and boiling points.

2. _____ They are composed of two non-metals.

3. _____ They can sometimes have resonance structures.

4. _____ Their atoms are arranged into distinct molecules.

5. _____ They are generally solid at room temperature.

6. _____ They conduct electricity when dissolved in water.

Part IV - Multiple Choice: For each of the following, pick the best answer.

1. _____ Which of the following bonds is the weakest?
   a. single covalent bond b. double covalent bond c. triple covalent bond d. hydrogen bond

2. _____ Which of the following types of attractions is the strongest?
   a. dispersion forces b. dipole interactions c. covalent bonds d. hydrogen bonds

3. _____ Which of the following molecules has polar bonds but is a non-polar molecule?
   a. silicon tetrahydride b. ammonia c. silicon dioxide d. dihydrogen monoxide

4. _____ Which of the following is a non-polar covalent bond?
   a. C - N b. N - H c. C - O d. N - O

5. _____ Which of the following is an ionic bond?
   a. H-O b. P-F c. C-O d. O-K

6. _____ Which of the following intermolecular forces explains why fluorine is a gas, but iodine is a solid?
   a. dispersion forces b. dipole interactions c. hydrogen bonds d. covalent bonds

7. _____ Which of the following molecules would have the most hydrogen bonding?
   a. H_2O b. H_2 c. CH_4 d. HCN

8. _____ Which of the following molecules has the strongest dispersion forces?
   a. H_2 b. I_2 c. Br_2 d. F_2

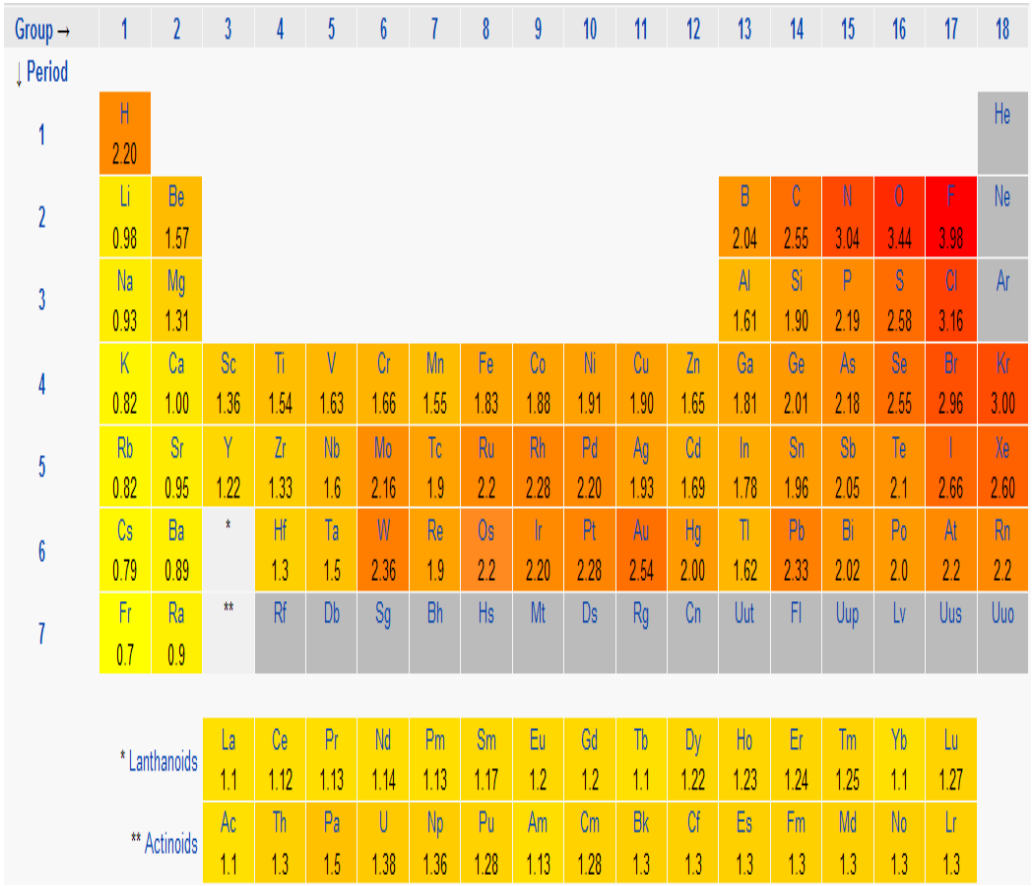
9. _____ Which of the following compounds does not have a resonance structure?
   a. sulfur dichloride b. nitrate ion c. sulfur dioxide d. carbonate ion

10. _____ Which of the following elements does not follow the octet rule?
    a. carbon b. nitrogen c. hydrogen d. iodine

11. _____ Which of the following bonds is the longest?
    a. single bond b. double bond c. triple bond d. all bonds are the same length

12. _____ Which of the following best describes the bond between chlorine and bromine in BrCl?
    a. polar single covalent bond b. non-polar single covalent bond
    c. polar double covalent bond d. non-polar covalent bond

13. _____ Which of the following molecules has the strongest bonds between atoms?
    a. H_2 b. F_2 c. O_2 d. N_2


Group → 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18
↓ Period
1 H 2.20 He
2 Li 0.98 Be 1.57 B 2.04 C 2.55 N 3.04 O 3.44 F 3.98 Ne
3 Na 0.93 Mg 1.31 Al 1.61 Si 1.90 P 2.19 S 2.58 Cl 3.16 Ar
4 K 0.82 Ca 1.00 Sc 1.36 Ti 1.54 V 1.63 Cr 1.66 Mn 1.55 Fe 1.83 Co 1.88 Ni 1.91 Cu 1.90 Zn 1.65 Ga 1.81 Ge 2.01 As 2.18 Se 2.55 Br 2.96 Kr 3.00
5 Rb 0.82 Sr 0.95 Y 1.22 Zr 1.33 Nb 1.6 Mo 2.16 Tc 1.9 Ru 2.2 Rh 2.28 Pd 2.20 Ag 1.93 Cd 1.69 In 1.78 Sn 1.96 Sb 2.05 Te 2.1 I 2.66 Xe 2.60
6 Cs 0.79 Ba 0.89 * Hf 1.3 Ta 1.5 W 2.36 Re 1.9 Os 2.2 Ir 2.20 Pt 2.28 Au 2.54 Hg 2.00 Tl 1.62 Pb 2.33 Bi 2.02 Po 2.0 At 2.2 Rn 2.2
7 Fr 0.7 Ra 0.9 ** Rf Db Sg Bh Hs Mt Ds Rg Cn Uut Fl Uup Lv Uus Uuo
* Lanthanoids La 1.1 Ce 1.12 Pr 1.13 Nd 1.14 Pm 1.13 Sm 1.17 Eu 1.2 Gd 1.2 Tb 1.1 Dy 1.22 Ho 1.23 Er 1.24 Tm 1.25 Yb 1.1 Lu 1.27
** Actinoids Ac 1.1 Th 1.3 Pa 1.5 U 1.38 Np 1.36 Pu 1.28 Am 1.13 Cm 1.28 Bk 1.3 Cf 1.3 Es 1.3 Fm 1.3 Md 1.3 No 1.3 Lr 1.3