Name _____ Honors Chemistry ___/___/___

SOL Questions – Chapter 5

For each of the following bubble it the best answer on the BLUE side of your scantron.

1. According to the Lewis diagram to the right, a nitrogen molecule has a —

a. bent structure and a double bond
b. linear structure and a triple bond
c. polar structure and a triple bond
d. circular structure and an ionic bond

2. Sodium iodide exhibits what type of bond?

a. Covalent b. Ionic c. Hydrogen d. Metallic

3. Water has several unique properties such as high boiling point, high surface tension, and low vapor pressure. The type of attraction that *best* accounts for these unique properties is —

a. dispersion forces b. coordinate covalent bonding c. hydrogen bonding d. ionic bonding

4. The type of bond found in magnesium chloride is:

a. covalent b. nonpolar
c. ionic d. metallic

Melting and Boiling Points of Some Bond Types

Substance	Type of Bond	Boiling Point	Melting Point	Phase at 24°C
Helium	Atom (monoatomic)	-269°C	-272°C	Gas
Hydrogen	Molecule (nonpolar covalent)	-253°C	-259°C	Gas
Iron	Atom (Metallic Crystall)	3000°C	1535°C	Solid
Sodium chloride	Ionic Crystal	1413°C	800°C	Solid
Water	Molecule (polar covalent)	100°C	0°C	Liquid

5. According to the table, which of these probably has the strongest bonds?

a. Hydrogen gas b. Iron crystals
c. Sodium chloride d. Water

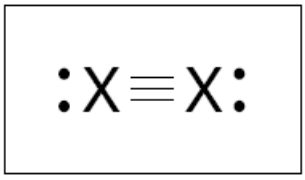
6. Which compound contains both ionic and covalent bonds?

a. NH_4Cl b. $MgBr_2$
c. CH_4 d. NH_3

7. The correct name for the compound CCl_4 is —

a. carbon tetrachloride b. carbon chloride
c. monocarbon chloride d. tetracarbon monochloride

8. In chemical compounds, covalent bonds form when:



a. the electronegativity difference between two atoms is very large
b. electrons are completely transferred between two metals
c. pairs of electrons are shared between two nonmetal atoms
d. two nonmetal ions are attracted to each other by opposite charges

9. If the above diagram were the correct representation for the Lewis structure of a molecule, then the X would be representative of the element —

a. oxygen b. fluorine c. nitrogen d. sulfur

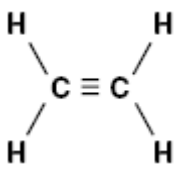
10. Which of the following is the correct molecular shape of CH_4?

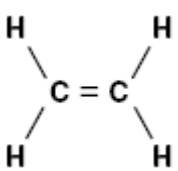
a. Bent b. Linear c. Pyramidal d. Tetrahedral

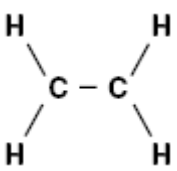
11. What is the chemical name for the compound P_3N_5?

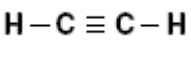
a. Triphosphorus nitride b. Phosphorus(III) nitride
c. Triphosphorus pentanitride d. Pentaphosphorus trinitride

12. The correct structural formula for C_2H_4 is —

a. 

b. 

c. 

d. 

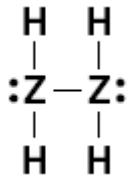
13. Electronegativity differences are often helpful in determining the bond character between two atoms. A general rule states that if the electronegativity difference between two atoms is greater than 1.67, an ionic bond would most likely be formed. Using the chart to the right, which pair of atoms would probably form the strongest ionic bond?

a. Al-P b. Na-Cl
c. K-F d. Ca-O

Electronegativity Values of Some Atoms

2.1 H						
1.0 Li	1.5 Be	2.0 B	2.5 C	3.0 N	3.5 O	4.0 F
0.9 Na	1.2 Mg	1.5 Al	1.8 Si	2.1 P	2.5 S	3.0 Cl
0.8 K	1.0 Ca				2.4 Se	2.8 Br

14. The figure to the right shows a compound containing hydrogen (H) and an unknown element Z. To which group on the periodic table does element Z belong?



a. 13 b. 14
c. 15 d. 16

15. Which of the following is the name of the molecule PCl_3?

a. Phosphorus trichloride b. Phosphorus chloride
c. Potassium trichloride d. Potassium chloride

16. The formula for dinitrogen tetroxide is —

a. N_2O_4 b. N_3O_3 c. N_2O_2 d. NO

17. What shape does the molecule BF_3 have?

a. Bent b. Linear c. Tetrahedral d. Trigonal planar

18. The correct name for P_2O_5 is —

a. phosphorus (V) pentoxide b. phosphorus oxide c. phosphorus (II) oxide d. diphosphorus pentoxide

19. At room temperature, chlorine exists as a gas, bromine exists as a liquid, and iodine exists as a solid. The physical states of these elements indicate that melting point —

a. decreases from top to bottom within group 17 elements b. is independent of periodic position
c. increases from top to bottom within group 17 elements d. is constant within group 17 elements

20. The type of formula that shows the arrangements of atoms and bonds is called —

a. empirical b. chemical c. molecular d. structural

21. Bonding between two elements of equal electronegativity would be —

a. 100% covalent b. primarily ionic c. 50% ionic d. metallic in character

22. Which compound has a covalent bond?

a. CaI_2 b. KBr c. NaCl d. NO

23. What are shared in covalent bonds?

a. Cations b. Protons c. Electrons d. Anions

24. If the difference in electronegativity between atoms of different non-metals is small, the atoms of the two non-metals will most likely —

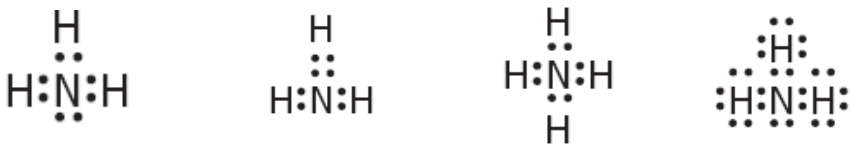
a. form an ionic bond b. form a hydrogen bond c. form a covalent bond d. form a metallic bond

25. Which of these best describes the difference between the formulas for nitrogen monoxide and nitrogen dioxide?

a. Nitrogen monoxide has one more atom of nitrogen. b. Nitrogen dioxide has one fewer atom of oxygen.
c. Nitrogen monoxide has one fewer atom of oxygen. d. Nitrogen dioxide has one more atom of nitrogen.

26. Which of the following represents the Lewis dot diagram of ammonia, NH_3?

a. b. c. d.



27. What is the correct name for the compound P_4O_6?

a. Phosphoric acid b. Phosphorus oxide c. Phosphorus(IV) oxide d. Tetraphosphorus hexoxide