Chemistry Homework Chapter 7

Class:_____ **Number:**_____ **Name:**_____

____ 1. Which Lewis Dot Formula below is **incorrect**?

a. 

b. 

c. 

d. 

e.

____ 2. Which Lewis Dot Formula below is **incorrect**?

a. 

b.

c. 

d. 

e. 

____ 3. How many <u>unpaired</u> electrons are shown in a Lewis Dot Formula for silicon?

a. 0 b.1 c.2 d.3 e. 4

____ 4. An atom of which element below has the most unpaired electrons?

a. Ba b.Al c.P d.F e.O

____ 5. Which choice below represents the general reaction of the 1A metals with the 7A elements?

a. $2\,M(s) + X_2 \rightarrow 2\,MX(s)$ b. $M(s) + X \rightarrow MX(s)$ c. $M_2(s) + X_2 \rightarrow 2\,MX(s)$

d. $M(s) + X_2 \rightarrow MX_2(s)$ e. none of these

____ 6. Magnesium and nitrogen react to form Mg_3N_2 an ionic compound. The magnesium ion, Mg^{2+}, has ____ electrons in its highest **occupied** energy level.

a. 8 b.2 c.10 d.4 e.5

____ 7. What is the charge on the simple (single atom) ion that sulfur forms?

a. 1^+ b. 2^+ c. 3^+ d. 1^- e. 2^-

____ 8. What is the formula for the binary ionic compound of aluminum and sulfur?

a. AlS b. Al_2S c. AlS_2 d. Al_3S_2 e. Al_2S_3

____ 9. Which one of the formulas below is **incorrect**?

a. $MgCl_2$ b. Na_2I c. InF_3 d. K_2S e. SrO

____ 10. The ionic solid NaCl is more stable than a mixture of Na and Cl atoms. This is best explained by:

a. The large, negative crystal lattice energy compensates for the energy lost when forming Na^+ and Cl^-.

b. Both the electron affinity for Cl and the ionization energy for Na are negative values.

c. The negative value for the electron affinity for Cl is larger than the ionization energy required for Na.

d. The negative value for the ionization energy required for Na is larger than the electron affinity for Cl.

e. None of these is the correct explanation.

____ 11. The number of **unshared pairs** of electrons in the outer shell of sulfur in H_2S is ____.

a. One b. two c. three d. four e. zero

____ 12. The **total** number of **covalent bonds** in the N_2 molecule is ____.

a. One b. two c. three d. four e. zero

____ 13. The number of **unshared pairs** of electrons in the outer shell of arsenic in AsF_3 is ____.

a. One b. two c. three d. four e. zero

____ 14. Assign a formal charge to each atom of .

a. As = 5+, Cl = 1- b. As = 5-, Cl = 7+ c. As = 0, Cl = 0
d. As = 4+, Cl = 1- e. As = 6+, Cl = 2-

____ 15. Which of the following statements about Lewis structures is **false**?

a. Carbon and oxygen may form a double bond.
b. Any Noble gas involved in a bond must be violating the octet rule.
c. N, P and As can sometimes share more than 8 e^-.
d. H can never make more than one bond.
e. Quadruple bonds are not possible.

____ 16. Which response lists all the molecules below that have **one** unshared pair of electrons on the central atom, and no other molecules?

H_2O, NF_3, BF_3, OF_2

a. H_2O b. NF_3 c. NF_3 and OF_2 d. H_2O, NF_3, and OF_2 e. H_2O and NF_3

____ 17. Which one of the following violates the octet rule?

a. PCl_4^+ b. ClF c. CCl_3^- d. BCl_3 e. $AsCl_3$

____ 18. How many resonance structures does the nitrate ion, NO_3-, have?

a. 1 b. 2 c. 3 d. 4 e. 0

____ 19. Which response includes all of the molecules that have **nonpolar** bonds, and no others?

Cl_2, $BeCl_2$, I_2, BrCl, BCl_3

a. Cl_2, $BeCl_2$, and I_2 b. Cl_2 and I_2 c. Cl_2, $BeCl_2$, and BrCl
d. $BeCl_2$ and BCl_3 e. BrCl

____ 20. The elements of Group VIIA may react with each other to form covalent compounds. Which of the following single covalent bonds in such compounds is the **most polar** bond?
Electronegativities of the first four Group VIIA elements are: F = 4.0, Cl = 3.0, Br = 2.8, I = 2.5

a. F-F b. F-Cl c. F-Br d. F-I e. Cl-I

____ 21. Which molecule contains the **least** polar bonds?
(Electronegativities: H = 2.1, C = 2.5, F = 4.0, Cl = 3.0, Br = 2.8, I = 2.5)

a. CF_4 b. CCl_4 c. CBr_4 d. CI_4 e. CH_4

____ 22. Which molecule would have the **weakest** dipole moment?

a. HBr b. HF c. HI d. H_2 e. HCl

____ 23. Which of the following molecules has the **most ionic** bond character?

a. NCl_3 b. F_2 c. HF d. ClF e. HCl

____ 24. What **kind of bond** does the **transfer** of electrons between atoms produce?

a. nonpolar covalent b. polar covalent c. ionic d. coordinate covalent

____ 25. An **ionic bond** is *most likely* to be formed *between*

a. a metal of low ionization energy and a nonmetal of low (very positive) electron affinity.
b. a metal of high ionization energy and a nonmetal of high (very negative) electron affinity.
c. a metal of high ionization energy and a nonmetal of low (very positive) electron affinity.
d. a metal of low ionization energy and a nonmetal of high (very negative) electron affinity.

Chapter 7
Answer Section

MULTIPLE CHOICE

1. ANS: B PTS: 1 TOP: Lewis Dot Formulas of Atoms
2. ANS: C PTS: 1 DIF: * Harder Question
   TOP: Lewis Dot Formulas of Atoms
3. ANS: C PTS: 1 TOP: Lewis Dot Formulas of Atoms
4. ANS: C PTS: 1 DIF: * Harder Question
   TOP: Lewis Dot Formulas of Atoms
5. ANS: A PTS: 1 TOP: Formation of Ionic Compounds
6. ANS: A PTS: 1 TOP: Formation of Ionic Compounds
7. ANS: E PTS: 1 TOP: Formation of Ionic Compounds
8. ANS: E PTS: 1 TOP: Formation of Ionic Compounds
9. ANS: B PTS: 1 TOP: Formation of Ionic Compounds
10. ANS: A PTS: 1 TOP: Formation of Ionic Compounds
11. ANS: B PTS: 1 TOP: Writing Lewis Formulas: The Octet Rule
12. ANS: C PTS: 1 TOP: Writing Lewis Formulas: The Octet Rule
13. ANS: A PTS: 1 TOP: Writing Lewis Formulas: The Octet Rule
14. ANS: C PTS: 1 TOP: Formal Charge
15. ANS: C PTS: 1
    TOP: Writing Lewis Formulas: Limitations of the Octet Rule for Lewis Formulas
16. ANS: B PTS: 1
    TOP: Writing Lewis Formulas: Limitations of the Octet Rule for Lewis Formulas
17. ANS: D PTS: 1
    TOP: Writing Lewis Formulas: Limitations of the Octet Rule for Lewis Formulas
18. ANS: C PTS: 1 TOP: Resonance
19. ANS: B PTS: 1 TOP: Polar and Nonpolar Covalent Bonds
20. ANS: D PTS: 1 TOP: Polar and Nonpolar Covalent Bonds
21. ANS: D PTS: 1 TOP: Polar and Nonpolar Covalent Bonds
22. ANS: D PTS: 1 TOP: Dipole Moments
23. ANS: C PTS: 1 TOP: The Continuous Range of Bonding Types
24. ANS: C PTS: 1 TOP: Additional Questions
25. ANS: D PTS: 1 TOP: Additional Questions