Name: .....

Ionic Practice

1. Describe how an ionic bond forms.

2. Ionic bonds form between which two types of elements? Why?

3. For each element, draw the Lewis dots diagram (based on valence electrons).

   a) K
   b) F
   c) Se
   d) Ca
   e) O
   f) N

4. For each set of elements, use the criss cross method to determine the correct chemical formula

   a) Ba Cl
   b) Rb Br
   c) Ca O
   d) Li N
   e) Na P
   f) Al F

5. For each compound draw the dot diagrams and show how the electrons are transferred

   a) NaI
   NaI

   b) CaF_2
   CaF_2

   c) BaO
   BaO

   d) K_2S
   K_2S

   e) RbF
   RbF

   f) Li_3N
   Li_3N

Name: .....

Covalent Practice

1. Describe how a covalent bond forms.

2. Covalent bonds form between what kinds of elements?

3. For each element, draw the Lewis dots diagram (based on valence electrons).

   a) N
   b) Cl
   c) Se
   d) P
   e) Br
   f) I

4. For each compound, draw the Lewis dot diagram.

   a) CH_4
   CH_4

   b) PH_3
   PH_3

   c) H_2O
   H_2O

   d) HCN
   HCN

   d) Br_2
   Br_2

   e) N_2
   N_2

   f) BF_3
   BF_3

   h) SiO_2
   SiO_2

Summary of Chemical Bonds

Type of Bond	Describe the bond.	How does it form? (What happens to e-?)	What kind(s) of elements form it?	What is the smallest unit called?	Properties
Ionic					
Covalent					
Metallic					

Molecular Shapes

Formula	Lewis Diagram	Shape	Angle Between Bonds
HBr			
BeF_2			
BCl_3			
CH_4			
NH_3			
H_2Se			
HCN			
PF_3			
CBr_4			

Polarity

Formula	Structure	Name of Shape	Polar?
F_2			
HCl			
CO_2			
CH_4			
H_2O			
$BeCl_2$			
NH_3			
BF_3			
CH_3Cl			

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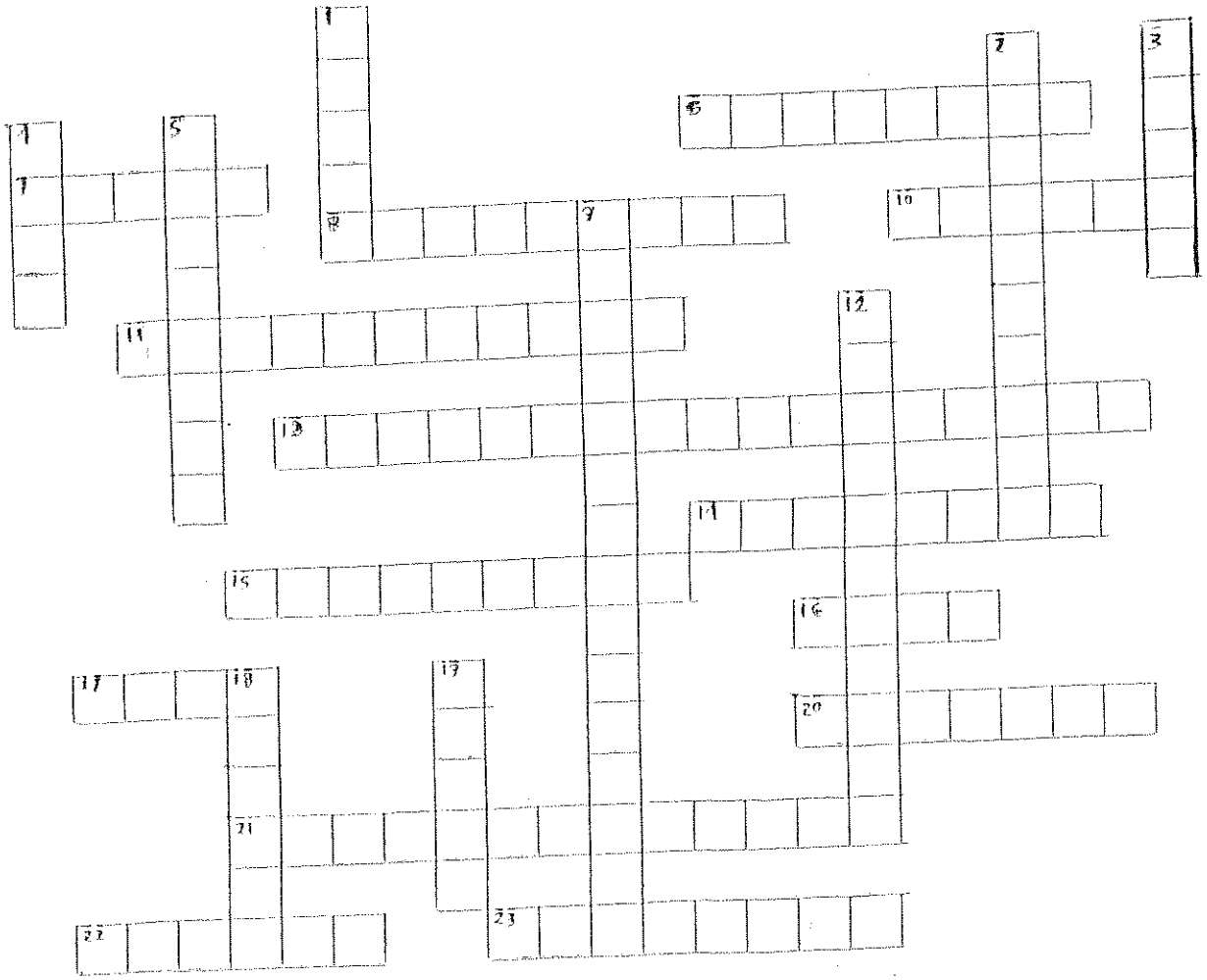
Bonding Review

1. Why do atoms obey the octet rule when forming ions?
2. An ionic bond occurs between what two types of elements?
3. What holds an ionic bond together?
4. A covalent bond occurs between what two types of elements?
5. Determine the number of valence electrons for each:
   a. Be_____ b. P_____ c. Cl_____
6. How do each of these elements obey the octet rule when forming compounds? (Do they gain or lose electrons? How many?)
   a. gallium:_____
   b. potassium:_____
   c. sulfur:_____
   d. bromine:_____
7. What is the electron configuration for each:
   a. a magnesium ion:_____
   b. a bromine ion:_____
   c. a germanium ion:_____
8. What is the net charge on any ionic compound (i.e. $MgBr_2$)?_____
9. What is the formula unit when the following elements come together to form a compound?
   a. calcium and chlorine_____
   b. lithium and oxygen_____
   c. calcium and sulfur_____
   d. beryllium and phosphorus_____
10. Identify these as characteristics of "ionic", "covalent", or "metallic":
    a._____ conducts electricity when melted or dissolved.
    b._____ usually liquids or gases at room temperature
    c._____ made of a metal and a nonmetal
    d._____ high melting points
    e._____ sea of electrons
    f._____ solids at room temperature
    g._____ forms molecules
    h._____ brittle
    i._____ dissolve easily in water
11. List the 7 diatomic molecules:_____
12. In a single covalent bond, how many electrons are being shared between the two atoms?_____
13. What is a lone pair?_____
14. Draw the following molecules and name each shape:
    a._____ N_2
    b._____ Br_2
    c._____ HCN
    d._____ $SeCl_2$
    e._____ $AlCl_3$
    f._____ PBr_3
    g._____ $SiBr_4$
15. Use the difference in electronegativities to determine the type of bond that each would form (ionic, polar covalent, or nonpolar covalent):
    a. magnesium (1.2) and iodine (2.5)_____
    b. calcium (1.0) and oxygen (3.5)_____
    c. carbon (2.5) and selenium (2.4)_____
16. Explain a hydrogen bond:_____

(6)

Bonding



Across

6 The type of bond that involves metals and their "sea" of electrons
7 The type of bond formed when electrons Are transferred
8 Covalent bonds only involve these types of elements
10 The intermolecular force that occurs Between two polar molecules
11 The lowest whole-number ratio of ions in an ionic compound
13 This determines what type of bond is formed
14 The kind of bond that happens when atoms share electrons
15 A property of metals that shows they can be dented (not crumbled)
16 The sum of the charges in an ionic compound must always equal this
17 The shape of a water molecule
20 A regular, repeating arrangement of atoms, ions, or molecules
21 A group of atoms with an overall charge
22 The shape of a carbon dioxide molecule
23 The intermolecular force that occurs between a hydrogen atom of one molecule and either N, O, or F of a different molecule

Down

1 The element that is an exception to the octet rule and only needs 6 electrons to be stable
2 The intermolecular force that occurs between two nonpolar molecules
3 The rule that says atoms bond to attain 7 valence electrons
4 The kind of melting point that an ionic compound has
5 The type of molecule that consists of 2 of the same type of atom bonded together
9 The shape of PH_3
12 The shape of CH_4
18 The shortest covalent bond
19 The type of covalent bond that happens when 2 atoms do not share electrons equally