**Unit 9A Chemical Formulas, Bonding and Naming**

**Extra Test Prep Practice KEY**

**Objective: Reading/Interrupting Chemical Compounds**

1. What is the atomic tally for the following compounds?
   1. 3Na2CO3 Na =6 C=3 O=9 Total: 18
   2. NH4Cl N=1 H=4 Cl=1 Total: 6
   3. 2Ba(SO4)2 Ba=2 S=4 O=16 Total:22
2. What is the formula mass for the following compounds?
   1. Ca(OH)2 Ca = 1 x 40.08 = 40.08 O= 2 x 16.00 = 32.00 H = 2 x 1.01 =2.02 **Total: 74.1**
   2. (NH4)2CO3 N = 2 x 14.00 = 28.00 H = 8 x 1.01=8.08 C= 1 x 12.01=12.01   
      O= 3 x 16.00 =48.00 **Total: 96.09**
   3. Al2(SO4)3 Al = 2 x 26.98 = 53.96 S = 3 x 32.06 = 96.18 O = 12 x 16.00 = 192 **Total: 342.14**
3. Solve for percent composition of the following compounds:
   1. CuBr2…. What percent is Cu? Cu = 1 x 63.55 = 63.55 Br = 2 x 79.90 = 159.8 Total: 223.35 so percent copper…. 63.55/223.35 x 100 = **28.45%**
   2. NaOH… What percent is O? Na = 1 x 22.98 = 22.98 O = 1 x 16.00 = 16.00 H= 1 x 1.01 = 1.01 Total: 39.99 so percent oxygen… 16 / 39.99 x 100 = **40.01%**
   3. 2O2…. What percent is O? Well the only element is oxygen… so percent oxygen is **100%**... if you did the math it would be O = 2 x 16.00 = 32.00…. 32.00 / 32.00 x 100 = 100%

**Objective: Ionic Bonding**

1. What does it mean for an atom to be an ion?

An ion is an atom with a charge, it has a charged because it has gained or lost electrons in order to become stable… by gaining or losing electrons it no longer has the same number of protons (+) as electrons (-) so the overall charge will be unbalanced

1. When atoms gain electrons in order to become stable, their overall charge is… negative
2. When atoms lose electrons in order to become stable, their overall charge is… positive
3. What are positively charged ions called? cation
4. What are negatively charged ions called? anion
5. When dealing with bonding we are concerned about valence electrons, what are valence electrons? How do you figure out how many valence electrons an atom would have?

Valence electrons are the electrons on the outermost shell of an atom, you figure out valence electrons by drawing out the Bohr model or by looking at trends on the periodic table (everything in the first column has 1, the second column has 2, skip the transition metals… then everything under Boron has 3 etc.)

1. What is an ionic bond? What type of elements are they made out of?

An ionic bond is formed between two oppositely charged atoms (a positive and a negative, or cation and anion), it is made out of a metal and a non-metal

1. Put the following ions together into the correct formula for the given ionic compounds, don’t forget to use parenthesis if needed.
   1. Au1+  N3- Au3N
   2. Na1+ O2- Na2O
   3. Mg2+ OH1- Mg(OH)2
   4. Fe2- PO4 3- Fe3(PO4)2
   5. K1+ S2- K2S
2. Name the following ionic compounds.
   1. LiBr Lithium bromide
   2. BeS Beryllium sulfide
   3. K2O Potassium oxide
   4. CaSO4 Calcium sulfate
   5. FeCO3 Iron (II) carbonate

**Objective: Covalent Compounds**

1. What is a covalent bond? What type of elements are they made out of?

Is a bond between two atoms in which electrons are SHARED (like carebears☺), it is created between two non-metals

1. Based off of the names given, what is the compound formula?
   1. Phosphorus trichloride PCl3
   2. Diphosphorus pentoxide P2O5
   3. Dinitrogen pentoxide N2O5
   4. Sulfur dioxide SO2
   5. Diarsenic pentasulfide As2S5
2. Based off of the compound formula given, what is the name?
   1. SO3 Sulfur trioxide
   2. CO Carbon monoxide
   3. CS2 Carbon disulfide
   4. CCl4 Carbon tetrachloride
   5. C2Br4 Dicarbon tetrabromide

**Mixed practice:**

Complete the following chart to do some mixed practice.

|  |  |  |
| --- | --- | --- |
| **Formula** | **Ionic or Covalent** | **Name** |
| OF2 | Covalent | Oxygen difluoride |
| Ba3P2 | Ionic | Barium phosphide |
| S2O4 | Covalent | Disulfur tetraoxide |
| C2H4 | Covalent | Dicarbon tetrahydride |
| H2 | Covalent | Hydrogen |
| Fe3N2 (had to reverse boogie) | Ionic | Iron (II) nitride |
| KCN | Ionic | Potassium Nitride |
| Ca3N2 | Ionic | Calcium Nitride |