

## Bonding &amp; Formula Writing Test Review

- Why do atoms bond? **Atoms bond to be more stable. They are more stable when they have a full octet.**
- What is an ionic bond? (definition) **Ionic Bonding = a chemical bond resulting from electrical attraction between large numbers of cations and anions.**
- What types of elements form an ionic bond? **A metal bonds with a nonmetal to form an ionic bond.**
- What happens to the electrons in an ionic bond? **The electrons are transferred in an ionic bond. The metal loses his electrons, and the nonmetal gains the electrons.**
- What is a covalent bond? (definition) **Covalent bonding = a chemical bond resulting from the sharing of electrons between two atoms.**
- What types of elements form a covalent bond? **A nonmetal bonded with a nonmetal form a covalent bond.**
- What happens to the electrons in a covalent bond? **Electrons in a covalent bond are shared.**
- What happens to the electrons in a metallic bond? (This causes metals to be ductile, malleable, and have luster. You should know those terms). **Electrons are shared as a group or "sea of electrons." The mass sharing of electrons results in luster (shininess), malleability (ability to be pounded flat into thin sheets), and ductility (the ability to be pulled into wires).**
- Which one of the following is a molecule (that means a covalent bond)? A) NaCl, B) CaCl<sub>2</sub>, **C) H<sub>2</sub>O**, D) Mg<sub>3</sub>N<sub>2</sub>
- Draw Lewis Dot Diagrams for the following atoms.

a. Potassium **K<sup>•</sup>**d. Carbon **•C•**g. Bromine **•Br•**b. Strontium **•Sr•**e. Nitrogen **•N•**h. Argon **•Ar•**c. Aluminum **Al•**f. Sulfur **•S•**i. Helium **•He•**↑ full w/ 2 e<sup>-</sup>

- Make sure that you know the charges for every group on the periodic table.

|    |    |                  |  |  |  |  |  |    |    |    |    |    |   |
|----|----|------------------|--|--|--|--|--|----|----|----|----|----|---|
| +1 | +2 | Ionic Charges    |  |  |  |  |  | +3 | +4 | -3 | -2 | -1 | 0 |
|    |    | Variable Charges |  |  |  |  |  |    |    |    |    |    |   |

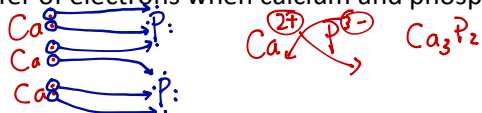
- Write formulas for each combination. Be sure to reduce when necessary. If it is a transition metal, you will be told the charge, if it is a polyatomic then you can look it up if you don't know it. Make sure you reduce when possible.

a. Ammonium & hydroxide  $\Rightarrow$  **NH<sub>4</sub><sup>+</sup> OH<sup>-</sup>  $\Rightarrow$  NH<sub>4</sub>OH**b. Calcium & sulfate  $\Rightarrow$  **Ca<sup>2+</sup> SO<sub>4</sub><sup>2-</sup>  $\Rightarrow$  CaSO<sub>4</sub>**c. Zinc (+2) & oxygen  $\Rightarrow$  **Zn<sup>2+</sup> O<sup>2-</sup>  $\Rightarrow$  ZnO**d. Potassium & sulfur  $\Rightarrow$  **K<sup>+</sup> S<sup>2-</sup>  $\Rightarrow$  K<sub>2</sub>S**e. Barium & nitrogen  $\Rightarrow$  **Ba<sup>2+</sup> N<sup>3-</sup>  $\Rightarrow$  Ba<sub>3</sub>N<sub>2</sub>**f. Calcium & Phosphate  $\Rightarrow$  **Ca<sup>2+</sup> PO<sub>4</sub><sup>3-</sup>  $\Rightarrow$  Ca<sub>3</sub>(PO<sub>4</sub>)<sub>2</sub>**g. Lithium & phosphorus  $\Rightarrow$  **Li<sup>+</sup> P<sup>3-</sup>  $\Rightarrow$  Li<sub>3</sub>P**h. Manganese (+2) & chlorate  $\Rightarrow$  **Mn<sup>2+</sup> ClO<sub>3</sub><sup>-</sup>  $\Rightarrow$  Mn(ClO<sub>3</sub>)<sub>2</sub>**i. Aluminum & Nitrite  $\Rightarrow$  **Al<sup>3+</sup> NO<sub>2</sub><sup>-</sup>  $\Rightarrow$  Al(NO<sub>2</sub>)<sub>3</sub>**j. Ammonium & Sulfate  $\Rightarrow$  **NH<sub>4</sub><sup>+</sup> SO<sub>4</sub><sup>2-</sup>  $\Rightarrow$  (NH<sub>4</sub>)<sub>2</sub>SO<sub>4</sub>**

- What ions form the following compounds? (Be careful, some have been reduced.)

a. Ca(CN)<sub>2</sub> **Ca<sup>2+</sup> CN<sup>-</sup>**c. Hg<sub>3</sub>(PO<sub>4</sub>)<sub>2</sub> **Hg<sup>2+</sup> PO<sub>4</sub><sup>3-</sup>**e. CaCO<sub>3</sub> **Ca<sup>2+</sup> CO<sub>3</sub><sup>2-</sup>**b. AlPO<sub>4</sub> **Al<sup>3+</sup> PO<sub>4</sub><sup>3-</sup>**d. PbO<sub>2</sub> **Pb<sup>4+</sup> O<sup>2-</sup>**f. Rb<sub>3</sub>P **Rb<sup>+</sup> P<sup>3-</sup>**

- Draw the ionic transfer of electrons when calcium and phosphorus bond.



- Draw the covalent sharing of electrons when hydrogen and sulfur bond.

