Ionic Bonds

* Ionic bonds form between metals and non-metals.
* In naming simple ionic compounds, the metal is always first, the non-metal second (e.g., sodium chloride).
* Ionic compounds dissolve easily in water and other polar solvents.
* In solution, ionic compounds easily conduct electricity.

|  |  |  |  |
| --- | --- | --- | --- |
| Element | Number of Valence Electrons | # of electrons gained or lost to fill outer energy level | Charge  (Oxidation Number) |
| **Sodium** | 7 | +1 | -1 |
| **Chlorine** | 1 | -1 | +1 |
| **Beryllium** | 6 | +2 | -2 |
| **Fluorine** | 1 | +1 | -1 |
| **Lithium** | 7 | -1 | +1 |
| **Oxygen** | 2 | -2 | +2 |
| **Potassium** | 17 | -1 | +1 |
| **Magnesium** | 6 | -2 | +2 |
| **Phosphorous** | 3 | +3 | -3 |
| **Aluminum** | 5 | -3 | +3 |

* Ionic compounds tend to form crystals with high melting temperatures.

Naming Ionic Compounds

* Write the metal first and the non-metal second
* Use the atomic number to indicate the number of atoms of each type present in the compound
* No prefixes
* Change the final syllable of the non-metal to say ine.

Directions: Complete the chart below.

Directions: For each of the following elements, draw Lewis dot diagrams and arrows to show the transfer of electrons. Then, write the chemical formula and name for the compound.

|  |  |
| --- | --- |
| **1)Sodium + Chlorine** | **2) Potassium + Iodine** |
| Formula: Na+ Cl- | Formula: K+I- |
| Name: Sodium chloride | Name: Potassium iodide |
| **3) Magnesium + Oxygen** | **4) Calcium + Sulfur** |
| Formula: Mg2+O2- | Formula: Ca2+S2- |
| Name: Magnesium oxide | Name: Calcium sulfide |
| **5) Calcium + Chlorine** | **6) Magnesium + Fluorine** |
| Formula: Ca2+Cl-2 | Formula: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| Name: Calcium dichloride | Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

|  |  |
| --- | --- |
| **7) Potassium + Bromine** | **8) Potassium + Oxygen** |
| Formula: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Formula: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **9) Sodium + Oxygen** | **10) Aluminum + Chlorine** |
| Formula: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Formula: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **11) Calcium + Fluorine** | **12) Magnesium + Iodine** |
| Formula: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Formula: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |