

Name: \_\_\_\_\_ Period: \_\_\_\_\_ Date: \_\_\_\_\_

# Ionic Bonding Chart

## Background:

When a chemical formula for a compound is written correctly, it shows the number of each type of atom in the compound. These numbers, called subscripts, are determined by the bonding between the atoms.

The table shows two columns of elements. The elements in the first column usually give up electrons when they form compounds. The elements in the second column usually gain electrons when they form compounds. The column next to the elements gives the number of electrons found in the outer level of each element. Using this information, determine the charge on the ion after the exchange of electrons. Remember, atoms that give up electrons become positive ions (called cations) while atoms that gain electrons become negative ions (called anions).

Now, show how the positive ion would combine with the negative ion to make a neutral compound. For example, sodium (Na) has one electron in its outer level. It gives up this electron and becomes a 1+ ion. Sulfur (S) having six electrons in its outer level gains two electrons to fill this outer level with eight electrons. Sulfur becomes 2- ion. These two ions then combine to form Na<sub>2</sub>S. This formula is correct because it takes two sodium ions to match the 2- charge on one sulfur ion.

**Part 1:** Read the following background information. Then fill in the chart below by determining the charge for each ion. Remember that a cation ("cat-ion") is simply a positively charged atom, while an anion ("an-ion") is negative.



Element (metal)	Valence electrons	Charge of the cation	Element (nonmetal)	Valence electrons	Charge of the anion	Formula
Aluminum	3	3+	Chlorine	7	1-	AlCl <sub>3</sub>
Magnesium			Bromine			
Sodium			Oxygen			
Lithium			Oxygen			
Calcium			Phosphorus			
Aluminum			Oxygen			
Beryllium			Sulfur			
Sodium			Fluorine			
Tin			Chlorine			
Silicon			Neon			

**Part 2:** Use the periodic table to help you complete the following chart regarding elements' ionic charges.

Element	Atomic Number	Number of Protons (+)	Number of Electrons (-)	Number of Valence Electrons	Cation (+) or Anion (-)	Net Charge
Hydrogen	1	1	1	1	cation	1+
Helium						
Lithium						
Beryllium						
Boron						
Carbon						
Nitrogen						
Oxygen						
Fluorine						
Neon						
Sodium						
Magnesium						
Aluminum						
Silicon						
Phosphorus						
Sulfur						
Chlorine						
Argon						
Potassium						
Calcium						