

Bonding and Chemical Formulas

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, while atoms that gain electrons become negative ions.

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 a 2- ion. These two ions then combine to form Na_2S . This formula is correct because it takes two sodium ions to match the 2- charge on one sulfur ion.

Element	Electrons In Outer Level	Charge on the Ion	Element	Electrons in Outer Level	Charge on the Ion	Formula
Aluminum	3		Chlorine	7		
Magnesium	2		Bromine	7		
Sodium	1		Oxygen	6		
Lithium	1		Oxygen	6		
Calcium	2		Phosphorus	5		
Carbon	4		Chlorine	7		
Aluminum	3		Oxygen	6		
Beryllium	2		Sulfur	6		
Sodium	1		Fluorine	7		
Silicon	4		Neon	8		