

## Counting Atoms

The formula for a compound indicates the elements that make up the compound and the number of atoms of each element present in the compound. These numbers of atoms are indicated by the use of small numbers called subscripts. Sometimes groups of atoms act as a single atom. Such a group of atoms is called a *polyatomic ion*. If a polyatomic ion is used in a formula more than once, it is put in parentheses and the subscript appears outside the parentheses. When a subscript appears outside the parentheses, it indicates that *all* the elements inside the parentheses should be multiplied by that subscript. For example, the formula  $\text{Fe}(\text{OH})_3$  indicates the combination of one atom of iron, Fe, three atoms of oxygen, O, and three atoms of hydrogen, H.

In the following examples, list each element in the compound and the number of atoms of each element present. The first example has been done for you.

Name	Use	Formula	Atoms in Formula
Calcium carbonate	Limestone	$\text{CaCO}_3$	Ca = calcium 1 C = carbon 1 O = oxygen 3
Aspirin	Pain reliever	$\text{C}_9\text{H}_8\text{O}_4$	
Magnesium hydroxide	Found in milk of magnesia	$\text{Mg}(\text{OH})_2$	
Paradichlorobenzene	Moth crystals	$\text{C}_6\text{H}_4\text{Cl}_2$	
Acetic acid	Found in vinegar	$\text{C}_2\text{H}_4\text{O}_2$	
Trinitrotoluene (TNT)	Explosive	$\text{C}_7\text{H}_5(\text{NO}_2)_3$	
Calcium dihydrogen phosphate	Fertilizer	$\text{Ca}(\text{H}_2\text{PO}_4)_2$	

Name	Use	Formula	Atoms in Formula
Pyrite	Fool's gold	$\text{FeS}_2$	
Sucrose	Sugar	$\text{C}_{12}\text{H}_{22}\text{O}_{11}$	
Pentane	One of several components in gasoline	$\text{C}_5\text{H}_{12}$	
Sulfuric acid	Used in car batteries	$\text{H}_2\text{SO}_4$	
Cellulose	Found in wood products such as your pencil and paper	$\text{C}_6\text{H}_7\text{O}_2(\text{OH})_3$	
Asbestos	Insulator	$\text{H}_4\text{Mg}_3\text{Si}_2\text{O}_9$	
Dichlorodiphenyl-trichloroethane (DDT)	Banned pesticide	$\text{C}_{14}\text{H}_9\text{Cl}_5$	
Silicon dioxide	Sand	$\text{SiO}_2$	
Iron oxide	Rust	$\text{Fe}_2\text{O}_3$	
Butane	Lighter fluid	$\text{C}_4\text{H}_{10}$	