



Naming Inorganic Compounds 1

There are a number of methods for naming a compound, depending on what kind of compound it is. This worksheet will focus on **inorganic compounds**, or compounds that do not contain carbon (except for cyanide salts, carbon oxides, and carbonates).

Inorganic compounds are classified as either ionic or molecular. In **ionic compounds**, cations and anions are held together by ionic bonds and form a lattice structure, or crystal. **Molecular compounds** are held together by covalent bonds and do not contain ions. Molecular compounds form discrete molecules that are not strongly bonded to each other. Ionic compounds tend to contain metals; molecular compounds don't. Ionic compounds can be further classified into **binary compounds**, which contain only two elements, and **polyatomic compounds** which contain more than two.

BINARY IONIC COMPOUNDS

Binary compounds are composed of two elements, a metal and a non-metal. The metal acts as a **cation** or positive ion, and the non-metal is an **anion** or negative ion. The positive ion takes the same name as the element; the negative ion takes the root of its name from the element and then adds the ending *-ide*. The general form of the name is **[metal] [root of non-metal]ide**. So NaCl is sodium chloride. Other roots are listed at the right.

Br	bromine
Cl	chlorine
F	fluorine
I	iodine
N	nitrogen
O	oxygen
P	phosphorus
S	sulphur

Some metals can have more than one charge when they bond in an ionic compound. In these cases, we must say which charge it has. We indicate this with a roman numeral. Iron can have a charge of 2+ or 3+, so there is FeCl₂ (iron (II) chloride) and FeCl₃ (iron (III) chloride). Note that the roman numeral in the name doesn't give an indication of how many ions there are of iron, it only indicates the charge on the iron ion.

POLYATOMIC IONIC COMPOUNDS

There is one common polyatomic cation, NH₄⁺, which is called **ammonium**. So NH₄Cl is ammonium chloride.

There are many polyatomic anions, mostly involving oxygen. These are called **oxyanions**. A table of the most common oxyanions is at the top of the next page. The rows of the table represent different elements (or in the case of chromate and dichromate, different forms of the same element). Prefixes (*hypo-* and *per-*) and suffixes (*-ite* and *-ate*) are added to indicate how many oxygen atoms are in the ion compared to the main oxyanions in the third column. In compounds containing these oxyanions, we just use the name of the anion given in the table, rather than something ending in *-ide*. Na₂PO₄ is sodium phosphate.

Other common polyatomic anions include OH⁻ (hydroxide ion), CN⁻ (cyanide ion) and O₂²⁻ (peroxide ion).