# Naming Acids

Acids are divided into two groups: Binary and Oxyacids. Binary acids consist of two elements. Oxyacids consist of 3 elements, one of which is oxygen.

**1. NAMING BINARY ACIDS**: The name of the binary acid consists of two words. The first word has three parts:

the "hydro" prefix
the root of the nonmetal element
the "ic" ending

The second word is always "acid"

Examples:

HCl = hydro chlor ic acid = hydrochloric acid
HBr = hydro brom ic acid = hydrobromic acid
HF = hydro fluor ic acid = hydrofluoric acid

2. **NAMING OXYACIDS**: These are more difficult to name because these acids have hydrogen, a nonmetal, and may have varying numbers of oxygen atoms. For example, $H_2SO_5$, $H_2SO_4$, $H_2SO_3$, and $H_2SO_2$ are all acids. How do we name them? To begin, we need a point of reference. Our reference point is this:

The "ate" ions (sulfate, nitrate, etc) make the "ic" acids (sulfuric acid, nitric acid)

Examples:

$SO_4^{2-}$ = sulfate ion $H_2SO_4$ = sulfuric acid
$NO_3^-$ = nitrate ion $HNO_3$ = nitric acid

Once we have our point of reference, the acid with one more oxygen than the -ic acid is called the per-_____-ic acid. The acid with one less oxygen then the -ic acid is called the _____-ous acid. If the acid has one less oxygen than the -ous acid, it is called the hypo-_____-ous acid.

Examples:

$H_2SO_5$ = persulfuric acid $HNO_4$ = pernitric acid
$H_2SO_4$ = sulfuric acid $HNO_3$ = nitric acid
$H_2SO_3$ = sulfurous acid $HNO_2$ = nitrous acid
$H_2SO_2$ = hyposulfurous acid HNO = hyponitrous acid

The KEY: All you really need to know are the "ate" ions. After that, you can use the above scheme to name any oxyacid. To refresh your memory, here are some of the common "ate" ions:

sulfate = $SO_4^{2-}$ nitrate = $NO_3^-$
chlorate = $ClO_3^-$ bromate = $BrO_3^-$ IODATE $IO_3^-$
phosphate = $PO_4^{3-}$ carbonate = $CO_3^{2-}$

phosphoric acid $H_3PO_4$
phosphorous acid $H_3PO_3$
hypophosphorous acid $H_3PO_2$