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^-
phosphate = PO_4^{3-} carbonate = CO_3^{2-}

Naming Acids - Problems

Name these binary acids:

HF_____ HCl_____

H_2S_____ HBr_____

HI_____

Name these oxyacids:

H_2CO_4_____

H_2CO_3_____

H_2CO_2_____

H_2CO _____

$HClO_4$_____

$HClO_3$_____

$HClO_2$_____

$HClO$ _____

H_3PO_5_____

H_3PO_4_____

H_3PO_3_____

H_3PO_2_____

Write the formulas for these acids (they may or may not actually exist!):

perbromic acid_____

nitrous acid_____

hypobromous acid_____

chromic acid_____

chromous acid_____

pernitric acid_____

sulfurous acid_____

perchromic acid_____