

## Naming and Writing Chemical Formulas for Acids and Bases

Acids can be classified into two main groups, binary acids and polyatomic acids (aka - oxyacids)

For something to be an acid it must possess hydrogen and be dissolved in water - in other words in an aqueous environment.

**Binary Acids** contain two elements - Hydrogen and a non-metal.

Naming of binary acids:

- prefix - hydro
- root - non-metal name
- ending - "ic acid"

Examples:  $\text{HCl}_{(\text{aq})}$  - hydrochloric acid

$\text{HF}_{(\text{aq})}$  - hydrofluoric acid

To **write the formula** for a binary acid, determine the non-metal and its charge (from your oxidation sheet) and use the criss cross rule with hydrogen.

Example: Hydrosulfuric acid -  $\text{H}^{+1} \text{S}^{-2} = \text{H}_2\text{S}$

**Polyatomic Acids** contain oxygen atoms, more specifically they contain  $\text{H}^+$  and a polyatomic ion.

Naming of polyatomic acids:

- root of anion (polyatomic ion)
- replace "ate" with "ic acid"

Examples:  $\text{H}_2\text{SO}_4_{(\text{aq})}$  - sulfuric acid

$\text{H}_2\text{CO}_3_{(\text{aq})}$  - carbonic acid

To **write the formula for a polyatomic acid**, determine the polyatomic ion in the acid and determine the charge on the ion. Use the criss cross rule with hydrogen to write the correct formula.

Example: Nitric Acid -  $\text{H}^{+1} \text{NO}_3^{-1} = \text{HNO}_3$

**Naming Bases** is the same as naming a metal bonded to a hydroxide ion.

Example :  $\text{Ca}(\text{OH})_2_{(\text{aq})}$  - calcium hydroxide

For something to be a base it must possess hydroxide and be dissolved in water - in other words in an aqueous environment.

Name and write the Formulas for the following acids and bases

Formula	Name
HBr	hydrobromic acid
HCN	hydrocyanic acid
HIO <sub>3</sub>	iodic acid
HClO <sub>3</sub>	chloric acid
HFO <sub>3</sub>	fluoric acid
H <sub>3</sub> PO <sub>4</sub>	phosphoric acid
H <sub>3</sub> P	hydrophosphoric acid
HI	hydroiodic acid
$\overset{+1}{\text{H}}\overset{-1}{\text{IO}_3}$	Iodic acid
$\overset{+1}{\text{H}}\overset{-3}{\text{N}}$	Hydronitric acid
$\overset{+1}{\text{H}}\text{CH}_3\overset{-1}{\text{CO}_2}$	Acetic acid
	Hydrofluoric acid
	Bromic acid

Bonus!

Chemical Formula	Name
Mg(OH) <sub>2</sub>	
NH <sub>4</sub> OH	
LiOH	
	Aluminum hydroxide
	Barium hydroxide