

# Golden Sheet of Nomenclature

## Symbols and Charges for Monoatomic Ions

Symbol	Name	Symbol	Name	Symbol	Name
$\text{H}^+$	hydrogen ion	$\text{Sr}^{2+}$	strontium ion	$\text{Br}^-$	bromide
$\text{Li}^+$	lithium ion	$\text{Ba}^{2+}$	barium ion	$\text{I}^-$	iodide
$\text{Na}^+$	sodium ion	$\text{Ra}^{2+}$	radium ion	$\text{O}^{2-}$	oxide
$\text{K}^+$	potassium ion	$\text{Zn}^{2+}$	zinc ion	$\text{S}^{2-}$	sulfide
$\text{Rb}^+$	rubidium ion	$\text{Ca}^{2+}$	calcium ion	$\text{Se}^{2-}$	selenide
$\text{Cs}^+$	cesium ion	$\text{Al}^{3+}$	aluminum ion	$\text{Te}^{2-}$	telluride
$\text{Ag}^+$	silver ion	$\text{H}^-$	hydride	$\text{N}^{3-}$	nitride
$\text{Be}^{2+}$	beryllium ion	$\text{F}^-$	fluoride	$\text{P}^{3-}$	phosphide
$\text{Mg}^{2+}$	magnesium ion	$\text{Cl}^-$	chloride	$\text{As}^{3-}$	arsenide

Note that the letters in an anion's name before the -ide ending is the stem. For example, the stem for bromide is brom- and the stem for sulfur is sulf-.

## Symbols and Charges for Polyatomic Ions

Formula	Name	Formula	Name
$\text{NH}_4^+$	ammonium	$\text{ClO}_4^-$	perchlorate
$\text{NO}_3^-$	nitrate	$\text{C}_2\text{H}_3\text{O}_2^-$	acetate ( $\text{CH}_3\text{COO}^-$ )
$\text{NO}_2^-$	nitrite	$\text{ClO}_3^-$	chlorate
$\text{CrO}_4^{2-}$	chromate	$\text{ClO}_2^-$	chlorite
$\text{Cr}_2\text{O}_7^{2-}$	dichromate	$\text{ClO}^-$	hypochlorite
$\text{CN}^-$	cyanide	$\text{IO}_4^-$	periodate
$\text{MnO}_4^-$	permanganate	$\text{IO}_3^-$	iodate
$\text{OH}^-$	hydroxide	$\text{IO}^-$	hypoiodite
$\text{O}_2^{2-}$	peroxide	$\text{BrO}_3^-$	bromate
$\text{NH}_2^-$	amide	$\text{BrO}^-$	hypobromite
$\text{CO}_3^{2-}$	carbonate	$\text{HCO}_3^-$	hydrogen carbonate (bicarbonate)
$\text{SO}_4^{2-}$	sulfate	$\text{HSO}_4^-$	hydrogen sulfate (bisulfate)
$\text{SO}_3^{2-}$	sulfite	$\text{HSO}_3^-$	hydrogen sulfite (bisulfite)
$\text{C}_2\text{O}_4^{2-}$	oxalate	$\text{HC}_2\text{O}_4^-$	hydrogen oxalate (binoxalate)
$\text{PO}_4^{3-}$	phosphate	$\text{HPO}_4^{2-}$	hydrogen phosphate
$\text{PO}_3^{3-}$	phosphite	$\text{H}_2\text{PO}_4^-$	dihydrogen phosphate
$\text{S}_2\text{O}_3^{2-}$	thiosulfate	$\text{HS}^-$	hydrogen sulfide
$\text{AsO}_4^{3-}$	arsenate	$\text{BO}_3^{3-}$	borate
$\text{SeO}_4^{2-}$	selenate	$\text{B}_4\text{O}_7^{2-}$	tetraborate
$\text{SiO}_3^{2-}$	silicate	$\text{SiF}_6^{2-}$	hexafluorosilicate
$\text{C}_4\text{H}_4\text{O}_6^{2-}$	tartrate	$\text{SCN}^-$	thiocyanate

## Prefixes Used to Indicate Number in a Name Involving Two Non-metals

mono-	1	hexa-	6
di-	2	hepta-	7
tri-	3	octa-	8
tetra-	4	nona-	9
penta-	5	deca-	10

These prefixes are used in naming binary compounds involving two non-metals. Example include  $\text{P}_2\text{O}_5$ ,  $\text{Cl}_2\text{O}$ ,  $\text{NO}$ ,  $\text{N}_2\text{O}$ ,  $\text{NO}_2$ ,  $\text{N}_2\text{O}_5$ ,  $\text{PCl}_3$ ,  $\text{PCl}_5$ ,  $\text{SO}_2$ ,  $\text{SO}_3$ ,  $\text{SiO}_2$ . Sometimes metal ions are involved in a Greek prefix name, but these are less common. Examples include  $\text{UF}_6$ ,  $\text{SbCl}_3$ ,  $\text{SbCl}_5$ ,  $\text{OsO}_4$ ,  $\text{BiCl}_3$ .

# Golden Sheet of Nomenclature

There is a preferred order of the nonmetals when writing them in a formula. It is:  
Rn, Xe, Kr, B, Si, C, Sb, As, P, N, H, Te, Se, S, I, Br, Cl, O, F.

CO is carbon monoxide, **NOT** carbon monooxide. As<sub>4</sub>O<sub>6</sub> is tetrarsenic hexoxide, **NOT** tetraarsenic hexaoxide.

## Metals with more than one oxidation number

Symbol	Systematic name (stock system)	Classical Name	Symbol	Systematic Name (stock system)	Classical Name
Cu <sup>1+</sup>	copper (I)	cuprous	Hg <sub>2</sub> <sup>2+</sup>	mercury (I)	mercurous
Cu <sup>2+</sup>	copper (II)	cupric	Hg <sup>2+</sup>	mercury (II)	mercuric
Fe <sup>2+</sup>	iron (II)	ferrous	Pb <sup>2+</sup>	lead (II)	plumbous
Fe <sup>3+</sup>	iron (III)	ferric	Pb <sup>4+</sup>	lead (IV)	plumbic
Sn <sup>2+</sup>	tin (II)	stannous	Co <sup>2+</sup>	cobalt (II)	cobaltous
Sn <sup>4+</sup>	tin (IV)	stannic	Co <sup>3+</sup>	cobalt (III)	cobaltic
Cr <sup>2+</sup>	chromium (II)	chromous	Au <sup>+</sup>	gold (I)	aurous
Cr <sup>3+</sup>	chromium (III)	chromic	Au <sup>3+</sup>	gold (III)	auric
Mn <sup>2+</sup>	manganese (II)	manganous	Ni <sup>2+</sup>	nickel (II)	nickelous
Mn <sup>3+</sup>	manganese (III)	manganic	Ni <sup>3+</sup>	nickel (III)	nickelic

## Acid Names

Non-Oxygen Containing			Oxygen Containing (Oxyacids)	
Formula	Name when dissolved in H <sub>2</sub> O	Name as a pure compound	Formula	Name
HF	hydrofluoric acid	hydrogen fluoride	HNO <sub>3</sub>	nitric acid
HCl	hydrochloric acid	hydrogen chloride	HNO <sub>2</sub>	nitrous acid
HBr	hydrobromic acid	hydrogen bromide	H <sub>2</sub> SO <sub>4</sub>	sulfuric acid
HI	hydroiodic acid	hydrogen iodide	H <sub>2</sub> SO <sub>3</sub>	sulfurous acid
HCN	hydrocyanic acid	hydrogen cyanide	H <sub>3</sub> PO <sub>4</sub>	phosphoric acid
H <sub>2</sub> S	hydrosulfuric acid	hydrogen sulfide	HC <sub>2</sub> H <sub>3</sub> O <sub>2</sub> (CH <sub>3</sub> COOH)	acetic acid

Add the word acid to each name when saying or writing.  
Note that it is hydrogen sulfide, **NOT** hydrogen sulfide.

## Diatomic Elements

The following elements are diatomic elements: Br, I, N, Cl, H, O, and F. For example, hydrogen would be written as H<sub>2</sub> and oxygen would be written as O<sub>2</sub> when they are not combined with other elements. To remember this, remember the name “**Br**IN**C**HI**H**OF” (said brinkle-hoff) or the phrase “**I** **H**ave **N**o **B**right **O**r **C**lever **F**riends.” Lastly, you can look for the hockey puck (Hydrogen) and stick (Nitrogen, Oxygen, Fluorine, Chlorine, Bromine, Iodine).