

*Ions of Some Main-Group Metals (Groups IA - IIIA)*

Group	Element	Cation	Ion name
IA	H	H <sup>+</sup>	hydrogen ion
	Li	Li <sup>+</sup>	lithium ion
	Na	Na <sup>+</sup>	sodium ion
	K	K <sup>+</sup>	potassium ion
	Cs	Cs <sup>+</sup>	cesium ion
IIA	Mg	Mg <sup>2+</sup>	magnesium ion
	Ca	Ca <sup>2+</sup>	calcium ion
	Sr	Sr <sup>2+</sup>	strontium ion
	Ba	Ba <sup>2+</sup>	barium ion
IIIA	Al	Al <sup>3+</sup>	aluminum ion

*Ions of Some Transition Metals and Post-Transition Metals (Groups IVA and VA)*

Metal	Ion	Systematic name	Common name
Cadmium	Cd <sup>2+</sup>	cadmium ion	
Chromium	Cr <sup>2+</sup>	chromium(II) ion	chromous ion
	Cr <sup>3+</sup>	chromium(III) ion	chromic ion
Cobalt	Co <sup>2+</sup>	cobalt(II) ion	cobaltous ion
	Co <sup>3+</sup>	cobalt(III) ion	cobaltic ion
Copper	Cu <sup>+</sup>	copper(I) ion	cuprous ion
	Cu <sup>2+</sup>	copper(II) ion	cupric ion
Gold	Au <sup>3+</sup>	gold(III) ion	
Iron	Fe <sup>2+</sup>	iron(II) ion	ferrous ion
	Fe <sup>3+</sup>	iron(III) ion	ferric ion
Manganese	Mn <sup>2+</sup>	manganese(II) ion	manganous ion
	Mn <sup>3+</sup>	manganese(III) ion	manganic ion
Mercury	Hg <sub>2</sub> <sup>2+</sup>	mercury(I) ion	mercurous ion
	Hg <sup>2+</sup>	mercury(II) ion	mercuric ion
Nickel	Ni <sup>2+</sup>	nickel(II) ion	nickelous ion
Silver	Ag <sup>+</sup>	silver ion	
Zinc	Zn <sup>2+</sup>	zinc ion	
Tin	Sn <sup>2+</sup>	tin(II) ion	stannous ion
	Sn <sup>4+</sup>	tin(IV) ion	stannic ion
Lead	Pb <sup>2+</sup>	lead(II) ion	plumbous ion
	Pb <sup>4+</sup>	lead(IV) ion	plumbic ion
Bismuth	Bi <sup>3+</sup>	bismuth(III) ion	
	Bi <sup>5+</sup>	bismuth(V) ion	

*Ions of Some Nonmetals (Groups IVA - VIIA)*

Group	Element	Anion	Ion name
IVA	C	$C^{4-}$	carbide ion
	Si	$Si^{4-}$	silicide ion
VA	N	$N^{3-}$	nitride ion
	P	$P^{3-}$	phosphide ion
	As	$As^{3-}$	arsenide ion
VIA	O	$O^{2-}$	oxide ion
	S	$S^{2-}$	sulfide ion
VIA	Se	$Se^{2-}$	selenide ion
	Te	$Te^{2-}$	telluride ion
VIIA	F	$F^{-}$	fluoride ion
	Cl	$Cl^{-}$	chloride ion
	Br	$Br^{-}$	bromide ion
	I	$I^{-}$	iodide ion
IA	H	$H^{-}$	hydride ion

*Formulas and Names of Some Polyatomic Ions*

Formula	Name
$NH_4^{+}$	ammonium
$H_3O^{+}$	hydronium
$OH^{-}$	hydroxide
$CN^{-}$	cyanide
$O_2^{2-}$	peroxide
$N_3^{-}$	azide
$NO_2^{-}$	nitrite
$NO_3^{-}$	nitrate
$ClO^{-}$	hypochlorite
$ClO_2^{-}$	chlorite
$ClO_3^{-}$	chlorate
$ClO_4^{-}$	perchlorate
$MnO_4^{-}$	permanganate
$C_2H_3O_2^{-}$	acetate (OAc-)
$C_2O_4^{2-}$	oxalate
$CO_3^{2-}$	carbonate
$OCN^{-}$	cyanate
$SCN^{-}$	thiocyanate
$S_2O_3^{2-}$	thiosulfate
$CrO_4^{2-}$	chromate

$\text{Cr}_2\text{O}_7^{2-}$	dichromate
$\text{SO}_4^{2-}$	sulfate
$\text{SO}_3^{2-}$	sulfite
$\text{PO}_4^{3-}$	phosphate
$\text{HPO}_4^{2-}$	monohydrogen phosphate
$\text{H}_2\text{PO}_4^-$	dihydrogen phosphate
$\text{HCO}_3^-$	hydrogen carbonate (bicarbonate)
$\text{HSO}_4^-$	hydrogen sulfate (bisulfate)
$\text{HSO}_3^-$	hydrogen sulfite (bisulfite)

Thio concept

$\text{OCN}^-$	cyanate		$\text{SO}_4^{2-}$	sulfate
$\text{SCN}^-$	thiocyanate		$\text{S}_2\text{O}_3^{2-}$	thiosulfate

Group VIIA		Group VIA	
$\text{ClO}_3^-$	chlorate	$\text{SO}_4^{2-}$	sulfate
$\text{BrO}_3^-$	bromate	$\text{SeO}_4^{2-}$	selenate
$\text{IO}_3^-$	iodate	$\text{TeO}_4^{2-}$	tellurate
Group VA*		Group IVA	
$\text{PO}_4^{3-}$	phosphate	$\text{CO}_3^{2-}$	carbonate
$\text{AsO}_4^{3-}$	arsenate	$\text{SiO}_3^{2-}$	silicate

Formula	Name
$\text{XO}_n^{y-}$	stem + <i>-ate</i>
$\text{XO}_{n-1}^{y-}$	stem + <i>-ite</i>
$\text{XO}_{n-2}^{y-}$	<i>hypo-</i> + stem + <i>-ite</i>
$\text{XO}_{n+1}^{y-}$	<i>per-</i> + stem + <i>-ate</i>
$\text{X}^{y-}$	stem + <i>-ide</i>

Cation	Anion	Formula
$\text{Na}^+$	$\text{Cl}^-$	$\text{NaCl}$
$\text{Ca}^{2+}$	$\text{Br}^-$	$\text{CaBr}_2$
$\text{Na}^+$	$\text{S}^{2-}$	$\text{Na}_2\text{S}$
$\text{Mg}^{2+}$	$\text{O}^{2-}$	$\text{MgO}$
$\text{Fe}^{3+}$	$\text{O}^{2-}$	$\text{Fe}_2\text{O}_3$
$\text{Na}^+$	$\text{SO}_4^{2-}$	$\text{Na}_2\text{SO}_4$
$\text{Mg}^{2+}$	$\text{NO}_3^-$	$\text{Mg}(\text{NO}_3)_2$
$\text{NH}_4^+$	$\text{SO}_4^{2-}$	$(\text{NH}_4)_2\text{SO}_4$

$\text{SO}_4^{2-}$	sulfate
$\text{SO}_3^{2-}$	sulfite
$\text{SO}_2^{2-}$	hyposulfite
$\text{SO}_5^{2-}$	persulfate
$\text{S}^{2-}$	sulfide

$\text{NaCl}$	Sodium chloride
$\text{AlBr}_3$	Aluminum bromide
$\text{Ca}_3\text{P}_2$	Calcium phosphide
$\text{SrI}_2$	Strontium iodide
$\text{FeCl}_2$	Iron(II) chloride or ferrous chloride The cation charge must be specified since iron can form more than one charge.

*Examples*

NaOH	Sodium hydroxide
Ca(NO <sub>3</sub> ) <sub>2</sub>	Calcium nitrate
K <sub>3</sub> PO <sub>4</sub>	Potassium phosphate
(NH <sub>4</sub> ) <sub>2</sub> SO <sub>4</sub>	Ammonium sulfate
NH <sub>4</sub> F	Ammonium fluoride
CaCO <sub>3</sub>	Calcium carbonate
Mg(C <sub>2</sub> H <sub>3</sub> O <sub>2</sub> ) <sub>2</sub>	Magnesium acetate
Fe(OH) <sub>3</sub>	Iron(III) hydroxide or ferrous hydroxide
Cr <sub>3</sub> (PO <sub>4</sub> ) <sub>2</sub>	Chromium(II) phosphate
CrPO <sub>4</sub>	Chromium(III) phosphate
NaHCO <sub>3</sub>	Sodium hydrogen carbonate or sodium bicarbonate

Compound name	Acid name
<i>-ate</i>	<i>-ic + acid</i>
<i>-ite</i>	<i>-ous + acid</i>
<i>-ide</i>	<i>hydro- -ic + acid</i>

*Examples*

Example	Compound Name	Acid name
HClO <sub>3</sub>	hydrogen chlorate	chloric acid
H <sub>2</sub> SO <sub>4</sub>	hydrogen sulfate	sulfuric acid
HClO <sub>2</sub>	hydrogen chlorite	chlorous acid
HCl	hydrogen chloride	hydrochloric acid

*Examples*

NaHSO <sub>4</sub>	sodium hydrogen sulfate
NaH <sub>2</sub> PO <sub>4</sub>	sodium dihydrogen phosphate
Na <sub>2</sub> HPO <sub>4</sub>	sodium hydrogen phosphate
NaHCO <sub>3</sub>	sodium hydrogen carbonate or sodium bicarbonate