TABLE OF COMMON MONATOMIC IONS

- fixed-charge metals in Groups IA, IIA, and IIIA
- fixed-charge metals in Groups IB and IIB (transition elements)
- common-charge non-metals from Groups IVA, VA, VIA, and VIIA
- semi-metal from Group IVA

IA	IIA	IB	IIB	IIIA	IVA	VA	VIA	VIIA
H^+								H^-
Li^+	Be^{2+}				C^{4-}	N^{3-}	O^{2-}	F^-
Na^+	Mg^{2+}			Al^{3+}	Si^{4+}	P^{3-}	S^{2-}	Cl^-
K^+	Ca^{2+}		Zn^{2+}	Ga^{3+}			Se^{2-}	Br^-
Rb^+	Sr^{2+}	Ag^+	Cd^{2+}	In^{3+}				I^-
Cs^+	Ba^{2+}							

= Magnitude of charge is calculated by subtracting the group number from 8. Non-metal elements have a common or fixed charge/oxidation when compounded with metals. Yet oxidation values can vary depending on which non-metal elements they are combined with, as in polyatomic ions and molecular compounds.

TABLE OF COMMON VARIABLE-CHARGE METALS

- variable-charge transisiton metals
- variable-charge metals from groups IIIA and IVA

IVB	VB	VIB	VIIB	VIIIB			IB	IIB	IIIA	IVA
Ti^{2+} Ti^{3+}	V^{2+} V^{3+}	Cr^{2+} Cr^{3+} Cr^{6+}	Mn^{2+} Mn^{3+} Mn^{7+}	Fe^{2+} Fe^{3+}	Co^{2+} Co^{3+}	Ni^{2+} Ni^{3+}	Cu^{+} Cu^{2+}			Ge^{2+} Ge^{4+}
						Pd^{2+} Pd^{3+}				Sn^{2+} Sn^{4+}
						Pt^{2+} Pt^{3+}	Au^{+} Au^{3+}	Hg^{+} Hg^{2+}	Tl^{+} Tl^{3+}	Pb^{2+} Pb^{4+}

Comment: The variable-charge nature of certain metals presents a unique outcome in compound formation. Since these metals can form multiple charges they will compound with nonmetals (or polyatomic ions) in differing ratios. Therefore, the Roman numeral designation is required in the nomenclature to specify the correct compound. For example, there are several types of manganese oxides, each with characteristic chemical and physical properties. Manganese (III) oxide, Mn_2O_3, is a black mineral insoluble in water. Whereas, manganese (VII) oxide, Mn_2O_7, is a dark reddish mineral which is soluble in water. Manganese will also form two other oxides each with differing colors and solubilities.

LIST OF COMMON POLYATOMIC IONS

(Monatomic ions are listed first in the family.)

NITROGEN

N^{3-}	nitride
NO_2^-	nitr*ite*
NO_3^-	**nitr*ate***
NH_4^+	ammonium

PHOSPHORUS

P^{3-}	phosphide
PO_3^{3-}	phosph*ite*
HPO_3^{2-}	hydrogen phosphite
PO_4^{3-}	**phosph*ate***
HPO_4^{2-}	hydrogren phosphate
$H_2PO_4^-$	dihydrogen phosphate

SULFUR

S^{2-}	sulfide
SO_3^{2-}	sulf*ite*
HSO_3^-	hydrogen sulfite
SO_4^{2-}	**sulf*ate***
HSO_4^-	hydrogen sulfate
$S_2O_3^{2-}$	*thio*sulfate
$S_4O_7^{2-}$	*di*sulfate

CARBON

C^{4-}	carbide
CO_3^{2-}	**carbonate**
HCO_3^-	hydrogen carbonate (or bicarbonate)
CN^-	cyanide

ORGANIC (CARBON CONT.)

$HCOO^-$	formate (derived from *formic acid*, also written HCO_2^-)
$H_3C_2O_2^-$	acetate (derived from *acetic acid*, also commonly written CH_3COO^-)
$C_2O_4^{2-}$	oxalate (derived from *oxalic acid*)

OXYGEN

O^{2-}	oxide
O_2^{2-}	*per*oxide
OH^-	hydroxide

CHLORINE

Cl^-	chloride
ClO_4^-	*per*chlorate
ClO_3^-	**chlor*ate***
ClO_2^-	chlor*ite*
ClO^-	*hypo*chlorite

METALS/SEMI-METALS

MnO_4^-	permanganate
CrO_4^{2-}	**chromate**
$Cr_2O_7^{2-}$	*di*chromate
AsO_4^{3-}	arsenate
SiO_4^{4-}	silicate

OTHER COMMON ANIONS

BO_3^{3-}	borate
BrO_3^-	bromate
IO_3^-	**iodate**
IO_4^-	*per*iodate
OCN^-	cyanate
SCN^-	*thio*cyanate

NOTES

-ate ..... used to designate the oxyanion with the higher number of oxygen atoms

-ite ..... used to designate the oxyanion with the lower number of oxygen atoms

thio- ..... add one sulfur, remove one oxygen

per- ..... one additional oxygen

hypo- ..... one less oxygen

-ide ..... although this suffix is reserved for the monatomic anion, the exceptions are cyanide, hydroxide, and peroxide

di- ..... two or double (i.e., as with dichromate, double the numeric subscripts on the chromate ion and reduce the oxygen by one; retain charge)

SOME COMBINED IONS

HS^-	hydrogen sulfide
$NH_4PO_4^{2-}$	ammonium phosphate
$HC_2O_4^-$	hydrogen oxalate