Common Nonmetallic ROOTS

H = hydr-	B = bor-
C = carb-	N = nitr-
O = ox-	F = fluor-
Si = silic-	P = phosph-
S = sulf-	Cl = chlor-
As = arsen-	Se =selen-
Br = brom-	Sb = antimony-
I = iod-	

Common NONMETAL Ions

S^{2-} sulfide	Br^{1-} bromide
F^{1-} fluoride	H^{1-} hydride
Cl^{1-} chloride	I^{1-} iodide
P^{3-} phosphide	O^{2-} oxide
N^{3-} nitride	Se^{3-} selenide

Greek PREFIXES

mono- one	hexa- six
di- two	hepta- seven
tri- three	octa- eight
tetra- four	nona- nine
penta- five	deca- ten

Common METAL Ions

Cu^{+} copper (I) (cuprous)	Mn^{2+} manganese (II)
Cu^{2+} copper (II) (cupric)	Ni^{2+} nickel (II)
Fe^{2+} iron (II) (ferrous)	Ni^{3+} nickel (III)
Fe^{3+} iron (III) (ferric)	Co^{2+} cobalt (II)
Hg_2^{2+} mercury (I) (mercurious)	Co^{3+} cobalt (III)
Hg^{2+} mercury (II) (mercuric)	Cr^{3+} chromium (III)
Pb^{2+} lead (II) (plumbous)	Cr^{6+} chromium (VI)
Pb^{4+} lead (IV) (plumbic)	V^{5+} vanadium (V)
Sn^{2+} tin (II) (stannous)	Ti^{4+} titanium (IV)
Sn^{4+} tin (IV) (stannic)	

Polyatomic Ions

BO_3^{3-} borate ion

BrO_3^{-} bromate ion

BrO_4^{-} perbromate

$B_4O_7^{2-}$ tetraborate

$C_2H_3O_2^{-}$ acetate ion (CH_3COO^{-})

$C_6H_5O_7^{3-}$ citrate ion

ClO^{-} hypochlorite ion

ClO_2^{-} chlorite ion

ClO_3^{-} chlorate ion

ClO_4^{-} perchlorate ion

CN^{-} cyanide ion

CO_3^{2-} carbonate ion

$C_2O_4^{2-}$ oxalate ion

CrO_4^{2-} chromate ion

$Cr_2O_7^{2-}$ dichromate ion

HPO_4^{2-} hydrogen phosphate ion

HSO_4^{-} hydrogen sulfate ion

HCO_3^{-} hydrogen carbonate ion

$H_2PO_4^{-}$ dihydrogen phosphate ion

IO^{-} hypiodite ion

IO_2^{-} iodite ion

IO_3^{-} iodate ion

IO_4^{-} periodate ion

MnO_4^{-} permanganate ion

NH_4^{+} ammonium ion	SeO_3^{2-} selenite ion
NO_2^{-} nitrite ion	SeO_4^{2-} selenate ion
NO_3^{-} nitrate ion	SiO_4^{4-} silicate ion
O_2^{2-} peroxide ion	$S_2O_3^{2-}$ thiosulfate ion
OH^{-} hydroxide ion	SO_3^{2-} sulfite ion
PO_3^{3-} phosphite ion	SO_4^{2-} sulfate ion
PO_4^{3-} phosphate ion	SCN^{-} thiocyanate ion

Solubility Rules

Rule #1 – All alkali metal compounds are soluble.

Rule #2 – All ammonium salts are soluble.

Rule #3 – All nitrate, chlorate, acetate and perchlorate salts are soluble.

Rule #4 – All chloride, bromide and iodide salts are soluble.
EXCEPT – Ag^+, Hg_2^{2+}, Pb_2^{2+}

Rule #5 – All sulfates are soluble.
EXCEPT – Ba^{2+}, Ca^{2+}, Sr^{2+}, Hg_2^{2+}, Pb_2^{2+}

Rule #6 – All hydroxides are insoluble.
EXCEPT – Ba^{2+}, Ca^{2+}, Sr^{2+}, alkali metals

Rule #7 – All sulfides are insoluble.
EXCEPT – alkali metals and alkaline earth metals

Rule #8 – All sulfites, carbonates, chromates and phosphates are insoluble.
EXCEPT – NH_4^+, alkali metals

"like dissolves like"

Activity Series for Metals

Potassium	K^+	INCREASING REACTIVITY ↑
Sodium	Na^+	
Lithium	Li^+	
Barium	Ba^{2+}	
Strontium	Sr^{2+}	
Calcium	Ca^{2+}	
Magnesium	Mg^{2+}	
Aluminum	Al^{3+}	
Manganese	Mn^{2+}	
Zinc	Zn^{2+}	
Chromium	Cr^{2+}	
Iron	Fe^{2+}	
Cadmium	Cd^{2+}	
Cobalt	Co^{2+}	
Nickel	Ni^{2+}	
Tin	Sn^{2+}	
Lead	Pb^{2+}	
Hydrogen	H^+	(comparison)
Antimony	Sb^{2+}	
Bismuth	Bi^{2+}	↑
Copper	Cu^{2+}	
Mercury	Hg^{2+}	
Silver	Ag^+	
Platinum	Pt^+	

Electron Affinity

H −72						He (21)
Li −60	Be (241)	B −23	C −122	N 0	O −142	F −322	Ne (29)
Na −53	Mg (231)	Al −44	Si −119	P −74	S −200	Cl −348	Ar (35)
K −48	Ca (156)	Ga (−36)	Ge −116	As −77	Se −194	Br −323	Kr (39)
Rb −47	Sr (119)	In (−34)	Sn −120	Sb −101	Te −190	I −295	Xe (40)
Cs −45	Ba (52)	Tl (−48)	Pb −101	Bi −101	Po (−173)	At (−270)	Rn (40)

Electronegativity

H 2.20																	He n.a.
Li 0.98	Be 1.57											B 2.04	C 2.55	N 3.04	O 3.44	F 3.98	Ne n.a.
Na 0.93	Mg 1.31											Al 1.61	Si 1.90	P 2.19	S 2.58	Cl 3.16	Ar n.a.
K 0.82	Ca 1.00	Sc 1.36	Ti 1.54	V 1.63	Cr 1.66	Mn 1.55	Fe 1.83	Co 1.88	Ni 1.91	Cu 1.90	Zn 1.65	Ga 1.81	Ge 2.01	As 2.18	Se 2.55	Br 2.96	Kr 3.00
Rb 0.82	Sr 0.95	Y 1.22	Zr 1.33	Nb 1.60	Mo 2.16	Tc 1.90	Ru 2.20	Rh 2.28	Pd 2.20	Ag 1.93	Cd 1.69	In 1.78	Sn 1.96	Sb 2.05	Te 2.10	I 2.66	Xe 2.60
Cs 0.79	Ba 0.89	La 1.10	Hf 1.30	Ta 1.50	W 2.36	Re 1.90	Os 2.20	Ir 2.20	Pt 2.28	Au 2.54	Hg 2.00	Tl 1.62	Pb 2.33	Bi 2.02	Po 2.00	At 2.20	Rn n.a.
Fr 0.70	Ra 0.89	Ac 1.10	Rf n.a.	Db n.a.	Sg n.a.	Bh n.a.	Hs n.a.	Mt n.a.	Ds n.a.	Rg n.a.	Uub n.a.	—	Uuq n.a.	—	—	—	—