

# CHEMISTRY REFERENCE INFORMATION

Common Transition Metal and Polyatomic Ions			
Positive ions (Cations)		Negative ions (Anions)	
ammonium	NH <sub>4</sub> <sup>+</sup>	acetate	C <sub>2</sub> H <sub>3</sub> O <sub>2</sub> <sup>-</sup>
cadmium	Cd <sup>2+</sup>	bicarbonate	HCO <sub>3</sub> <sup>-</sup>
chromium(II)	Cr <sup>2+</sup>	carbonate	CO <sub>3</sub> <sup>2-</sup>
chromium(III)	Cr <sup>3+</sup>	chlorate	ClO <sub>3</sub> <sup>-</sup>
cobalt	Co <sup>2+</sup>	chlorite	ClO <sub>2</sub> <sup>-</sup>
copper(I)	Cu <sup>+</sup>	chromate	CrO <sub>4</sub> <sup>2-</sup>
copper(II)	Cu <sup>2+</sup>	dichromate	Cr <sub>2</sub> O <sub>7</sub> <sup>2-</sup>
iron(II)	Fe <sup>2+</sup>	hydride	H <sup>-</sup>
iron(III)	Fe <sup>3+</sup>	hydroxide	OH <sup>-</sup>
lead(II)	Pb <sup>2+</sup>	hypochlorite	ClO <sup>-</sup>
manganese(II)	Mn <sup>2+</sup>	nitrate	NO <sub>3</sub> <sup>-</sup>
mercury(I)	Hg <sub>2</sub> <sup>2+</sup>	nitrite	NO <sub>2</sub> <sup>-</sup>
mercury(II)	Hg <sup>2+</sup>	oxalate	C <sub>2</sub> O <sub>4</sub> <sup>2-</sup>
nickel	Ni <sup>2+</sup>	perchlorate	ClO <sub>4</sub> <sup>-</sup>
silver	Ag <sup>+</sup>	permanganate	MnO <sub>4</sub> <sup>-</sup>
tin(II)	Sn <sup>2+</sup>	phosphate	PO <sub>4</sub> <sup>3-</sup>
tin(IV)	Sn <sup>4+</sup>	sulfate	SO <sub>4</sub> <sup>2-</sup>
zinc	Zn <sup>2+</sup>	sulfite	SO <sub>3</sub> <sup>2-</sup>

Solubility of Some Ionic Compounds in Water			
Negative Ion	+	Positive Ion	Will be...
Any negative ion	+	Alkali metal ions (Li <sup>+</sup> , Na <sup>+</sup> , K <sup>+</sup> , Rb <sup>+</sup> , or Cs <sup>+</sup> )	Soluble
Any negative ion	+	Ammonium ion, NH <sub>4</sub> <sup>+</sup>	Soluble
Nitrate, NO <sub>3</sub> <sup>-</sup>	+	Any positive ion	Soluble
Acetate, CH <sub>3</sub> COO <sup>-</sup>	+	Any positive ion except Ag <sup>+</sup> or Hg <sup>2+</sup>	Soluble
Chloride, Cl <sup>-</sup> , or Bromide, Br <sup>-</sup> , or Iodide, I <sup>-</sup>	+	Ag <sup>+</sup> , Pb <sup>2+</sup> , Hg <sub>2</sub> <sup>2+</sup> , or Cu <sup>+</sup>	Insoluble
	+	Any other positive ion	Soluble
Sulfate, SO <sub>4</sub> <sup>2-</sup>	+	Ca <sup>2+</sup> , Sr <sup>2+</sup> , Ba <sup>2+</sup> , Ra <sup>2+</sup> , Ag <sup>+</sup> , or Pb <sup>2+</sup>	Insoluble
	+	Any other positive ion	Soluble
Sulfide, S <sup>2-</sup>	+	Alkali ions or NH <sub>4</sub> <sup>+</sup>	Soluble
	+	Be <sup>2+</sup> , Mg <sup>2+</sup> , Ca <sup>2+</sup> , Sr <sup>2+</sup> , Ba <sup>2+</sup> , or Ra <sup>2+</sup>	Soluble
	+	Any other positive ion	Insoluble
Hydroxide, OH <sup>-</sup>	+	Alkali ions or NH <sub>4</sub> <sup>+</sup>	Soluble
	+	Any other positive ion	Insoluble
Phosphate, PO <sub>4</sub> <sup>3-</sup> , or Carbonate, CO <sub>3</sub> <sup>2-</sup> , or Sulfite, SO <sub>3</sub> <sup>2-</sup>	+	Alkali ions or NH <sub>4</sub> <sup>+</sup>	Soluble
	+	Any other positive ion	Insoluble

Activity Series	
Metals	Halogens
lithium	fluorine
potassium	chlorine
calcium	bromine
sodium	iodine
magnesium	
aluminum	
zinc	
chromium	
iron	
nickel	
tin	
lead	
hydrogen	
copper	
mercury	
silver	
platinum	
gold	

SI Prefixes				
Prefix	Symbol	Factor	Example	
mega	M	10 <sup>6</sup>	1 Mm = 1 000 000 m	
kilo	k	10 <sup>3</sup>	1 km = 1 000 m	
BASE UNIT	---	10 <sup>0</sup>	---	
deci	d	10 <sup>-1</sup>	1 m = 10 dm	
centi	c	10 <sup>-2</sup>	1 m = 100 cm	
milli	m	10 <sup>-3</sup>	1 m = 1 000 mm	
micro	μ	10 <sup>-6</sup>	1 m = 1 000 000 μm	
nano	n	10 <sup>-9</sup>	1 m = 1 000 000 000 nm	
pico	p	10 <sup>-12</sup>	1 m = 1 000 000 000 000 pm	

Temperature Conversions		
°F = $\frac{9}{5}$ (°C) + 32	°C = $\frac{5}{9}$ (°F - 32)	K = °C + 273

SI-SI
1 cm <sup>3</sup> = 1 mL
1 dm <sup>3</sup> = 1 L

English-English
1 ton = 2000 lbs
1 ft = 12 in
1 yd = 3 ft
1 mi = 5280 ft

SI-English
1 kg = 2.2 lbs
1 in = 2.54 cm
1 L = 1.057 qt
1.609 km = 1 mi