

GENERAL CHEMISTRY REFERENCE SHEET

8/13/2018

Common Metric Prefixes and Units		
Unit	Symbol	Conversions
meter	m	1 m = 39.37 inches
centimeter	cm	1 inch = 2.54 cm
Angstrom	Å	1 Å = 1 x 10 ⁻¹⁰ m exactly
gram	g	1 g = 0.002205 lb
liter	L	1 L = 1000 cm ³ = 1.056710 qt
Kelvin	K	K = °C + 273.15
kilo	k	10 ³
deci	d	10 ⁻¹
centi	c	10 ⁻²
milli	m	10 ⁻³
micro	μ	10 ⁻⁶
nano	n	10 ⁻⁹
pico	p	10 ⁻¹²

Nomenclature

Common Cations		
Charge	Formula	Name
1+	H ⁺	hydrogen ion
	H ₃ O ⁺	hydronium ion
	Alkali metal ⁺	alkali metal ion
	NH ₄ ⁺	ammonium ion
	Ag ⁺	silver ion
	Cu ⁺	copper(I)
2+	Alkaline earth metal ²⁺	alkaline earth metal ion
	Zn ²⁺	zinc ion
	Co ²⁺	cobalt(II)
	Cu ²⁺	copper(II)
	Fe ²⁺	iron(II)
	Mn ²⁺	manganese(II)
	Hg ₂ ²⁺	mercury(I)
	Hg ²⁺	mercury(II)
	Ni ²⁺	nickel(II)
	Pb ²⁺	lead(II)
	Sn ²⁺	tin(II)
3+	Al ³⁺	aluminum ion
	Cr ³⁺	chromium(III)
	Fe ³⁺	iron(III)

Common Anions		
Charge	Formula	Name
1-	H ⁻	hydride ion
	F ⁻	fluoride ion
	Cl ⁻	chloride ion
	Br ⁻	bromide ion
	I ⁻	iodide ion
	CN ⁻	cyanide ion
	OH ⁻	hydroxide ion
	NO ₃ ⁻	nitrate
	NO ₂ ⁻	nitrite
	HCO ₃ ⁻	hydrogen carbonate or bicarbonate ion
	HSO ₄ ⁻	hydrogen sulfate ion

Charge	Formula	Name
1-	ClO ₄ ⁻	perchlorate ion
	ClO ₃ ⁻	chlorate ion
	ClO ₂ ⁻	chlorite ion
	ClO ⁻	hypochlorite ion
	MnO ₄ ⁻	permanganate ion
	H ₂ PO ₄ ⁻	dihydrogen phosphate ion
	C ₂ H ₃ O ₂ ⁻ (or CH ₃ COO ⁻)	acetate ion
2-	O ²⁻	oxide ion
	S ²⁻	sulfide ion
	SO ₄ ²⁻	sulfate ion
	SO ₃ ²⁻	sulfite ion
	CO ₃ ²⁻	carbonate ion
	Cr ₂ O ₇ ²⁻	dichromate ion
	HPO ₄ ²⁻	hydrogen phosphate
3-	PO ₄ ³⁻	phosphate ion

Other Compounds	
Formula	Name
H ₂ O	water
NH ₃	ammonia
CH ₄	methane (natural gas)
O ₃	ozone
H ₂ O ₂	hydrogen peroxide
H ₂ , N ₂ , O ₂ , F ₂ , Cl ₂ , Br ₂ , I ₂	diatomic molecules
He, Ne, Ar	Noble gases

Acids	
Formula	Name
HNO ₃	nitric acid (strong)
H ₂ SO ₄	sulfuric acid (strong)
HCl	hydrochloric acid (strong)
HBr	hydrobromic acid (strong)
HI	hydroiodic acid (strong)
HClO ₄	perchloric acid (strong)
H ₃ PO ₄	phosphoric acid (weak)
H ₂ CO ₃	carbonic acid (weak)
HC ₂ H ₃ O ₂ (or CH ₃ COOH)	acetic acid (weak)
HF	hydrofluoric acid (weak)

Bases	
Formula	Name
LiOH	lithium hydroxide (strong)
NaOH	sodium hydroxide (strong)
KOH	potassium hydroxide (strong)
Ba(OH) ₂	barium hydroxide (strong)
Sr(OH) ₂	strontium hydroxide (strong)
NH ₃	ammonia (weak)
NR ₃	other amines (weak)

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Alkanes (C _n H _{2n+2})	
Formula	Name
CH ₄	methane
C ₂ H ₆	ethane
C ₃ H ₈	propane
C ₄ H ₁₀	butane
C ₅ H ₁₂	pentane
C ₆ H ₁₄	hexane
C ₇ H ₁₆	heptane
C ₈ H ₁₈	octane
C ₉ H ₂₀	nonane
C ₁₀ H ₂₂	decane

Electrolytes and Dissociation

Electrolytic Behavior			
	Strong Electrolyte	Weak Electrolyte	Non-electrolyte
Dissociation	Complete (→)	Partial (⇌)	none
Soluble Ionic Compounds	all	none	none
Molecular Compounds	strong acids	weak acids and bases	all others

A Few Solubility Rules

Solubility Guidelines for Ionic Compounds in Water	
Soluble when containing:	Exceptions:
Alkali metal ions (group 1A)	none
NH ₄ ⁺	none
NO ₃ ⁻	none
C ₂ H ₃ O ₂ ⁻ (or CH ₃ COO ⁻)	none
Cl ⁻ , Br ⁻ , I ⁻	Ag ⁺ , Hg ₂ ²⁺ , Pb ²⁺
Insoluble when containing:	Exceptions:
Ions with charges 2+/- or higher*	see above

* There are many exceptions.