

Chemistry Reference Sheet

Periodic Table of the Elements

		Key													18																																																					
		11		12		13		14		15		16		17		18																																																				
		Atomic Number		Element Symbol		Element Name		Average Atomic Mass *																																																												
1	1	H	Hydrogen	1.008	2	2	He	Helium	4.003	13	5	B	Boron	10.811	6	C	Carbon	12.011	7	N	Nitrogen	14.007	8	O	Oxygen	15.999	9	F	Fluorine	18.998	10	Ne	Neon	20.180																																		
2	3	Li	Lithium	6.941	4	Be	Beryllium	9.012	11	11	Na	Sodium	22.990	12	12	Mg	Magnesium	24.305	13	13	Al	Aluminum	26.982	14	14	Si	Silicon	28.086	15	15	P	Phosphorus	30.974	16	16	S	Sulfur	32.066	17	17	Cl	Chlorine	35.453	18	18	Ar	Argon	39.948																				
3	19	K	Potassium	39.098	20	Ca	Calcium	40.078	21	21	Sc	Scandium	44.956	22	22	Ti	Titanium	47.867	23	23	V	Vanadium	50.942	24	24	Cr	Chromium	51.996	25	25	Mn	Manganese	54.938	26	26	Fe	Iron	55.845	27	27	Co	Cobalt	58.933	28	28	Ni	Nickel	58.693	29	29	Cu	Copper	63.546	30	30	Zn	Zinc	65.409										
4	37	Rb	Rubidium	85.468	38	Sr	Strontium	87.620	39	39	Y	Yttrium	88.906	40	40	Zr	Zirconium	91.224	41	41	Nb	Niobium	92.906	42	42	Mo	Molybdenum	95.940	43	43	Tc	Technetium	(98)	44	44	Ru	Ruthenium	101.070	45	45	Rh	Rhodium	102.906	46	46	Pd	Palladium	106.420	47	47	Ag	Silver	107.868	48	48	Cd	Cadmium	112.411										
5	55	Cs	Cesium	132.905	56	Ba	Barium	137.327	57	57	La	Lanthanum	138.905	58	58	Ce	Cerium	140.116	59	59	Pr	Praseodymium	140.908	60	60	Nd	Neodymium	144.242	61	61	Pm	Promethium	(145)	62	62	Sm	Samarium	150.360	63	63	Eu	Europium	151.964	64	64	Gd	Gadolinium	157.250	65	65	Tb	Terbium	158.925															
6	87	Fr	Francium	(223)	88	Ra	Radium	(226)	89	89	Ac	Actinium	(227)	90	90	Th	Thorium	232.038	91	91	Pa	Protactinium	231.036	92	92	U	Uranium	238.029	93	93	Np	Neptunium	(237)	94	94	Pu	Plutonium	(244)	95	95	Am	Americium	(243)	96	96	Cm	Curium	(247)	97	97	Bk	Berkelium	(247)	98	98	Cf	Californium	(251)	99	99	Es	Einsteinium	(252)	100	100	Fm	Fermium	(257)
7	118	Xe	Xenon	131.290	119	At	Astatine	(210)	120	120	Rn	Radon	(222)	121	121	Uuo	Ununseptium	(292)	122	122	Uub	Ununbium	(289)	123	123	Uut	Ununtrium	(285)	124	124	Uuq	Ununquadium	(289)	125	125	Uup	Ununpentium	(285)	126	126	Uuq	Ununquadium	(285)	127	127	Uuh	Ununhexium	(285)	128	128	Uuo	Ununoctium	(285)	129	129	Uuq	Ununquadium	(285)	130	130	Uuh	Ununhexium	(285)	131	131	Uuo	Ununoctium	(285)

* If this number is in parentheses, then it refers to the atomic mass of the most stable isotope.

Turn over for Formulas, Constants, and Unit Conversions

Chemistry Reference Page

Formulas, Constants, and Unit Conversions

Formulas	
Change in Enthalpy (Heat): $Q = m(\Delta T)c_p$	Heat of Fusion: $Q = m\Delta H_{fus}$
Ideal Gas Law: $PV = nRT$	Heat of Vaporization: $Q = m\Delta H_{vap}$
Density: $d = \frac{m}{V}$	Molarity (M) = $\frac{\text{mol of solute}}{\text{L of solution}}$
Combined Gas Law: $\frac{P_1V_1}{T_1} = \frac{P_2V_2}{T_2}$	Molality (m) = $\frac{\text{mol of solute}}{\text{kg of solvent}}$
Boiling Point Elevation: $\Delta T_b = k_b \times m$	Freezing Point Depression: $\Delta T_f = k_f \times m$

Constants	
Universal Gas Constant (R): $0.0821 \frac{\text{atm} \times \text{L}}{\text{mol} \times \text{K}}$, or equal to $8.31 \frac{\text{kPa} \times \text{L}}{\text{mol} \times \text{K}}$	
Molar Volume at STP: $22.4 \frac{\text{L}}{\text{mol}}$	Avogadro's Number (1 mole): 6.02×10^{23}
Specific Heat Capacity of Liquid Water: $c_p (\text{H}_2\text{O}) = 1.00 \frac{\text{cal}}{\text{g} \times ^\circ\text{C}} = 4.18 \frac{\text{J}}{\text{g} \times ^\circ\text{C}}$	

Unit Conversions	
1 atm = 760 mm Hg = 760 Torr = 101.3 kPa = $14.7 \frac{\text{lb}}{\text{in.}^2} = 29.92 \text{ in. Hg}$	K = °C + 273
1.00 calorie = 4.184 Joules	1 mL = 1 cm ³ 1 L = 1,000 mL = 1,000 cm ³
giga (G) = 10 ⁹ , mega (M) = 10 ⁶ , kilo (k) = 10 ³ , hecto (h) = 10 ² , deka (da) = 10 ¹	
deci (d) = 10 ⁻¹ , centi (c) = 10 ⁻² , milli (m) = 10 ⁻³ , micro (μ) = 10 ⁻⁶ , nano (n) = 10 ⁻⁹	

Common Ions					
Element Name	Oxidation Numbers	Common Ions	Oxidation Numbers	Common Ions	Oxidation Numbers
Silver (Ag)	+1	Ammonium (NH ₄ ⁺)	+1	Oxide (O ²⁻)	-2
Zinc (Zn)	+2	Nitrate (NO ₃ ⁻)	-1	Sulfide (S ²⁻)	-2
Scandium (Sc)	+3	Nitrite (NO ₂ ⁻)	-1	Sulfate (SO ₄ ²⁻)	-2
Copper (Cu)	+1, +2	Hydrogen Carbonate (HCO ₃ ⁻)	-1	Sulfite (SO ₃ ²⁻)	-2
Gold (Au)	+1, +3	Perchlorate (ClO ₄ ⁻)	-1	Carbonate (CO ₃ ²⁻)	-2
Cobalt (Co)	+2, +3	Chlorate (ClO ₃ ⁻)	-1	Peroxide (O ₂ ²⁻)	-2
Nickel (Ni)	+2, +3	Chlorite (ClO ₂ ⁻)	-1	Chromate (CrO ₄ ²⁻)	-2
Lead (Pb)	+2, +4	Hypochlorite (ClO ⁻)	-1	Dichromate (Cr ₂ O ₇ ²⁻)	-2
Tin (Sn)	+2, +4			Phosphate (PO ₄ ³⁻)	-3
Mercury (Hg)	+1, +2				
Iron (Fe)	+2, +3				
Titanium (Ti)	+2, +3, +4				
Chromium (Cr)	+2, +3, +6				
Vanadium (V)	+2, +3, +4, +5				
Manganese (Mn)	+2, +3, +4, +7				

Turn over for Periodic Table of the Elements ↘