

		1		2		3		4		5		6		7		8		9		10		11		12		13		14		15		16		17		18																																																																																																																																																																																																						
		1A		2A		3B		4B		5B		6B		7B		8B						1B		2B		3A		4A		5A		6A		7A		8A																																																																																																																																																																																																						
1	1	<b>H</b> Hydrogen 1.01	2	<b>He</b> Helium 4.00	3	4	<b>Li</b> Lithium 6.94	5	<b>Be</b> Beryllium 9.01	6	7	<b>B</b> Boron 10.81	8	<b>C</b> Carbon 12.01	9	<b>N</b> Nitrogen 14.01	10	<b>O</b> Oxygen 16.00	11	<b>F</b> Fluorine 19.00	12	<b>Ne</b> Neon 20.18	13	<b>Na</b> Sodium 22.99	14	<b>Mg</b> Magnesium 24.31	15	<b>Al</b> Aluminum 26.98	16	<b>Si</b> Silicon 28.09	17	<b>P</b> Phosphorus 30.97	18	<b>S</b> Sulfur 32.07	19	<b>Cl</b> Chlorine 35.45	20	<b>Ar</b> Argon 39.95	21	<b>K</b> Potassium 39.10	22	<b>Ca</b> Calcium 40.08	23	<b>Sc</b> Scandium 44.96	24	<b>Ti</b> Titanium 47.87	25	<b>V</b> Vanadium 50.94	26	<b>Cr</b> Chromium 52.00	27	<b>Mn</b> Manganese 54.94	28	<b>Fe</b> Iron 55.85	29	<b>Ni</b> Nickel 58.69	30	<b>Cu</b> Copper 63.55	31	<b>Zn</b> Zinc 65.39	32	<b>Ga</b> Gallium 69.72	33	<b>Ge</b> Germanium 72.61	34	<b>As</b> Arsenic 74.92	35	<b>Se</b> Selenium 78.96	36	<b>Kr</b> Krypton 83.80	37	<b>Rb</b> Rubidium 85.47	38	<b>Sr</b> Strontium 87.62	39	<b>Y</b> Yttrium 88.91	40	<b>Zr</b> Zirconium 91.22	41	<b>Nb</b> Niobium 92.91	42	<b>Mo</b> Molybdenum 95.94	43	<b>Tc</b> Technetium (98)	44	<b>Ru</b> Ruthenium 101.07	45	<b>Rh</b> Rhodium 102.91	46	<b>Pd</b> Palladium 106.42	47	<b>Ag</b> Silver 107.87	48	<b>Cd</b> Cadmium 112.41	49	<b>In</b> Indium 114.82	50	<b>Sn</b> Tin 118.71	51	<b>Sb</b> Antimony 121.76	52	<b>Te</b> Tellurium 127.60	53	<b>I</b> Iodine 126.90	54	<b>Xe</b> Xenon 131.29	55	<b>Cs</b> Cesium 132.91	56	<b>Ba</b> Barium 137.33	57	<b>La</b> Lanthanum 138.91	58	<b>Ce</b> Cerium 140.12	59	<b>Pr</b> Praseodymium 140.91	60	<b>Nd</b> Neodymium 144.24	61	<b>Pm</b> Promethium (145)	62	<b>Sm</b> Samarium 150.36	63	<b>Eu</b> Europium 151.96	64	<b>Gd</b> Gadolinium 157.25	65	<b>Tb</b> Terbium 158.93	66	<b>Dy</b> Dysprosium 162.50	67	<b>Ho</b> Holmium 164.93	68	<b>Er</b> Erbium 167.26	69	<b>Tm</b> Thulium 168.93	70	<b>Yb</b> Ytterbium 173.04	71	<b>Lu</b> Lutetium 174.97	72	<b>Fr</b> Francium (223)	73	<b>Ra</b> Radium (226)	74	<b>Ac</b> Actinium (227)	75	<b>Rf</b> Rutherfordium (261)	76	<b>Hf</b> Hafnium 178.49	77	<b>Ta</b> Tantalum 180.95	78	<b>W</b> Tungsten 183.84	79	<b>Re</b> Rhenium 186.21	80	<b>Os</b> Osmium 190.23	81	<b>Ir</b> Iridium 192.22	82	<b>Pt</b> Platinum 195.08	83	<b>Au</b> Gold 196.97	84	<b>Hg</b> Mercury 200.59	85	<b>Tl</b> Thallium 204.38	86	<b>Pb</b> Lead 207.2	87	<b>Bi</b> Bismuth 208.98	88	<b>Po</b> Polonium (209)	89	<b>At</b> Astatine (210)	90	<b>Rn</b> Radon (222)	91	<b>Th</b> Thorium 232.04	92	<b>Pa</b> Protactinium 231.04	93	<b>U</b> Uranium 238.03	94	<b>Np</b> Neptunium (237)	95	<b>Pu</b> Plutonium (244)	96	<b>Am</b> Americium (243)	97	<b>Cm</b> Curium (247)	98	<b>Bk</b> Berkelium (247)	99	<b>Cf</b> Californium (251)	100	<b>Fm</b> Fermium (257)	101	<b>Md</b> Mendelevium (258)	102	<b>No</b> Nobelium (259)	103	<b>Lr</b> Lawrencium (262)	104	<b>Db</b> Dubnium (262)	105	<b>Sg</b> Seaborgium (266)	106	<b>Bh</b> Bohrium (264)	107	<b>Hs</b> Hassium (269)	108	<b>Mt</b> Meitnerium (268)	109	<b>Uu</b> Ununennium (289)	110	<b>Uub</b> Ununbium (288)	111	<b>Uut</b> Ununtrium (288)	112	<b>Uuq</b> Ununquadium (289)	113	<b>Uup</b> Ununpentium (288)	114	<b>Uuq</b> Ununhexium (288)	115	<b>Uup</b> Ununseptium (288)	116	<b>Uuq</b> Ununoctium (289)	117	<b>Uuh</b> Ununhennium (289)	118	<b>Uuo</b> Ununoctium (289)

**Key**

11	Atomic number
<b>Na</b>	Element symbol
Sodium	Element name
22.99	Average atomic mass*

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

## Formulas

**Ideal Gas Law:**  $PV = nRT$

**Combined Gas Law:**  $\frac{P_1 V_1}{T_1} = \frac{P_2 V_2}{T_2}$

**Pressure Formula:**  $P = \frac{F}{A}$

**Mass-Energy Formula:**  $E = mc^2$

**Calorimetric Formulas –**

**No Phase Change:**  $Q = m(\Delta T)C_p$

**Latent Heat of Fusion:**  $Q = m\Delta H_{\text{fus}}$

**Latent Heat of Vaporization:**  $Q = m\Delta H_{\text{vap}}$

## Constants

**Volume of Ideal Gas at STP:**  $22.4 \frac{\text{L}}{\text{mol}}$

**Speed of Light in a Vacuum:**  $c = 3.00 \times 10^8 \frac{\text{m}}{\text{s}}$

**Specific Heat of Water:**  $C_p(\text{H}_2\text{O}) = 1.00 \frac{\text{cal}}{(\text{g}^\circ\text{C})} = 4.18 \frac{\text{J}}{(\text{g}^\circ\text{C})}$

**Latent Heat of Fusion of Water:**  $\Delta H_{\text{fus}}(\text{H}_2\text{O}) = 80 \frac{\text{cal}}{\text{g}} = 334 \frac{\text{J}}{\text{g}}$

**Latent Heat of Vaporization of Water:**  $\Delta H_{\text{vap}}(\text{H}_2\text{O}) = 540 \frac{\text{cal}}{\text{g}} = 2260 \frac{\text{J}}{\text{g}}$

## Unit Conversions

**Calorie-Joule Conversion:**  $1 \text{ cal} = 4.184 \text{ J}$

**Absolute Temperature Conversion:**  $\text{K} = ^\circ\text{C} + 273$

**Pressure Conversions:**  $1 \text{ atm} = 760 \text{ mm Hg} = 760 \text{ Torr} = 101.325 \text{ kPa} = 14.7 \frac{\text{lbs.}}{\text{in.}^2} = 29.92 \text{ in. Hg}$