

ABBREVIATIONS AND SYMBOLS		
Amount in moles <b><i>n</i></b>	Free energy <b><i>G</i></b>	Molar mass <b><i>M</i></b>
Ampere <b><i>A</i></b>	Frequency <b><math>\nu</math></b>	Mole <b><i>mol</i></b>
Atmosphere <b><i>atm</i></b>	Gas constant <b><i>R</i></b>	Mole fraction <b><math>\chi</math></b>
Atomic mass unit <b><i>u</i></b>	Gram <b><i>g</i></b>	Planck's constant <b><i>h</i></b>
Avogadro constant <b><math>N_A</math></b>	Hour <b><i>h</i></b>	Pressure <b><i>P</i></b>
Celsius temperature <b><math>^{\circ}\text{C}</math></b>	Joule <b><i>J</i></b>	Rate constant <b><i>k</i></b>
Coulomb <b><i>C</i></b>	Kelvin <b><i>K</i></b>	Reaction quotient <b><i>Q</i></b>
Electromotive force <b><i>E</i></b>	Kilopascal <b><i>kPa</i></b>	Second <b><i>s</i></b>
Energy of activation <b><math>E_a</math></b>	Liter <b><i>L</i></b>	Speed of light <b><i>c</i></b>
Enthalpy <b><i>H</i></b>	Measure of pressure <b><i>mmHg</i></b>	Temperature, K <b><i>T</i></b>
Entropy <b><i>S</i></b>	Minute <b><i>min</i></b>	Time <b><i>t</i></b>
Equilibrium constant <b><i>K</i></b>	Molal <b><i>m</i></b>	Volt <b><i>V</i></b>
Faraday constant <b><i>F</i></b>	Molar <b><i>M</i></b>	Volume <b><i>V</i></b>

CONSTANTS
$R = 8.314 \text{ J} \cdot \text{mol}^{-1} \cdot \text{K}^{-1}$
$R = 0.0821 \text{ L} \cdot \text{atm} \cdot \text{mol}^{-1} \cdot \text{K}^{-1}$
$1 F = 96,500 \text{ C}$
$1 F = 96,500 \text{ J} \cdot \text{V}^{-1}$
$N_A = 6.022 \times 10^{23} \text{ mol}^{-1}$
$h = 6.626 \times 10^{-34} \text{ J} \cdot \text{s}$
$c = 2.998 \times 10^8 \text{ m} \cdot \text{s}^{-1}$
$1 \text{ atm} = 760 \text{ mmHg} = 101.3 \text{ kPa}$
$V \text{ (ideal gas) at STP} = 22.4 \text{ L} \cdot \text{mol}^{-1}$

**Note:** Negative exponents (e.g.  $-\text{g} \cdot \text{mol}^{-1}$ ), are used rather than a solidus (/).

### Memory Work: (Students are responsible for memorizing the information below)

METRIC SYSTEM			
SYMBOLS	PREFIXES	MATHEMATICAL MEANING	
<b>T</b> <i>pneumonic</i>	Tera-	$1,000,000,000,000 = 10^{12}$	
<b>G</b> <i>Great</i>	Giga-	$1,000,000,000 = 10^9$	
<b>M</b> <i>Merry</i>	Mega-	$1,000,000 = 10^6$	
<b>k</b> <i>knights</i>	kilo-	$1000 = 10^3$	
<b>h</b> <i>hate</i>	hecto-	$100 = 10^2$	
<b>da</b> <i>dancing</i>	deca-	$10 = 10^1$	
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		$1 = 10^0$	
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<b>d</b> <i>did</i>	deci-	$0.1 = 10^{-1}$	
<b>c</b> <i>clinton</i>	centi-	$0.01 = 10^{-2}$	
<b>m</b> <i>make</i>	milli-	$0.001 = 10^{-3}$	
<b><math>\mu</math></b> <i>many</i>	micro-	$0.000\ 001 = 10^{-6}$	
<b>n</b> <i>naughty</i>	nano-	$0.000\ 000\ 001 = 10^{-9}$	
<b>p</b> <i>proposals</i>	pico-	$0.000\ 000\ 000\ 001 = 10^{-12}$	
<b>f</b> <i>frequently</i>	fempto-	$0.000\ 000\ 000\ 000\ 001 = 10^{-15}$	

METRIC BASE UNITS		
<b>m</b> meter LENGTH	<b>g</b> grams MASS	<b>L</b> liter VOLUME
METRIC ↔ ENGLISH CONVERSION FACTORS:		
<u>LENGTH</u> $\left[ \begin{array}{c} 2.54 \text{ cm} = 1 \text{ in} \\ \text{M} \longleftrightarrow \text{E} \end{array} \right]$	<u>MASS</u> $\left[ \begin{array}{c} 453.6 \text{ g} = 1 \text{ lb} \\ \text{M} \longleftrightarrow \text{E} \end{array} \right]$	<u>VOLUME</u> $\left[ \begin{array}{c} .9463 \text{ L} = 1 \text{ qt} \\ \text{M} \longleftrightarrow \text{E} \end{array} \right]$
ENGLISH CONVERSION FACTORS:		
12 in = 1 ft 3 ft = 1 yd 36 in = 1 yd 5280 ft = 1 mi	16 oz = 1 lb 2000 lb = 1 ton	32 oz = 1 qt 4 cups = 1 qt 2 pts = 1 qt 4 qt = 1 gal 16 oz = 1 pt 8 oz = 1 cup  1 mL = 1 cm <sup>3</sup> 1 L = 1 dm <sup>3</sup>