



APPENDIX



Units of Measurement

Physical Constants		
Constant	Symbol	Value
Atomic mass unit	amu	$1.6606 \times 10^{-27} \text{ kg}$
Avogadro's number	N	$6.022 \times 10^{23} \text{ particles/mol}$
Gas constant	R (at STP)	$0.08205 \text{ L atm/K mol}$
Mass of an electron	m_e	$9.109 \times 10^{-28} \text{ g}$
Mass of a neutron	m_n	$5.486 \times 10^{-4} \text{ amu}$ $1.675 \times 10^{-27} \text{ kg}$
Mass of a proton	m_p	1.00866 amu $1.673 \times 10^{-27} \text{ kg}$ 1.00728 amu
Speed of light	c	$2.997925 \times 10^8 \text{ m/s}$

SI Units and Conversion Factors		
Length		Mass
SI unit: meter (m)		SI unit: kilogram (kg)
1 meter	= 1.0936 yards = 100 centimeters = 1000 millimeters	1 kilogram
1 centimeter	= 0.3937 inch	= 1000 grams = 2.20 pounds
1 inch	= 2.54 centimeters (exactly)	= 1000 milligrams = 453.59 grams
1 kilometer	= 0.62137 mile	= 0.45359 kilogram
1 mile	= 5280 feet = 1.609 kilometers	= 16 ounces = 2000 pounds
1 angstrom	= 10^{-10} meter	= 907.185 kilograms = 28.3 grams
		1 atomic mass unit = 1.6606×10^{-27} kilogram
Volume		Temperature
SI unit: cubic meter (m^3)		SI unit: kelvin (K)
1 liter	= 10^{-3} m^3 = 1 dm^3 = 1.0567 quarts = 1000 milliliters	0 K = -273.15°C = -459.67°F
1 gallon	= 4 quarts = 8 pints = 3.785 liters	K = $^\circ\text{C} + 273.15$
1 quart	= 32 fluid ounces = 0.946 liter	$^\circ\text{C} = \frac{^\circ\text{F} - 32}{1.8}$
1 fluid ounce	= 29.6 milliliters	$^\circ\text{F} = 1.8(\text{ }^\circ\text{C}) + 32$
		$^\circ\text{C} = \frac{5}{9}(\text{ }^\circ\text{F} - 32)$
Energy		Pressure
SI unit: joule (J)		SI unit: pascal (Pa)
1 joule	= $1 \text{ kg m}^2/\text{s}^2$ = 0.23901 calorie	1 pascal = 1 kg/m s^2
1 calorie	= 4.184 joules	1 atmosphere = 101.325 kilopascals = 760 torr (mm Hg) = 14.70 pounds per square inch (psi)