Factors and Constants

Useful Conversion Factors

$1\,dyn/cm^2 = 1.450 \times 10^{-5}\,lb/in^2 = 1.02 \times 10^{-6}\,kg/cm^2$
$1\,Pa = 10\,dyn/cm^2 = 7.5 \times 10^{-3}\,mm\,Hg = 1 \times 10^{-5}\,bar = 1.02 \times 10^{-5}\,kg/cm^2$
$= 1\,N/m^2 = 1\,J/m^3$
$1\,bar = 1\,atm\ pressure = 1 \times 10^5\,Pa$
$1\,J = 2.387 \times 10^{-1}\,cal = 1 \times 10^7\,erg$
$1\,Pa \cdot s = 10\ poise = 0.672\,lb/ft \cdot s = 2{,}420\,lb/ft \cdot h = 10\,g/cm \cdot s$
$1\,nm = 10\,Å$
$1\,N = 10^5\,dyn = 1.02 \times 10^{-1}\,kgf = 2.248 \times 10^{-1}\,lbf$
$1\,N \cdot m = 1\,J$
$MPa \cdot 145 = PSI$

Giga = 10^9	deci = 10^{-1}	micro = 10^{-6}
Mega = 10^6	centi = 10^{-2}	nano = 10^{-9}
Kilo = 10^3	milli = 10^{-3}	

C–C bond energy = 83 kcal/mol = 360 kJ/mol

Constants and Conversion Factors

Values of Often Used Constants†

Avogadro's number	N_A	6.022×10^{23} molecules/mol
Boltzmann's constant	k	$1.380 \times 10^{-16}\,erg/K = 1.380 \times 10^{-23}\,J/K$
Gas constant, molar	R	$8.314\,J/mol \cdot K = 82.15\,cm^3 \cdot atm/mol \cdot K$
		$= 1.987\,cal/mol \cdot K = 8.31 \times 10^7\,dyn \cdot cm/mol \cdot K$
		$= 8.314\,Pa \cdot m^3/mol \cdot K = 0.082051 \cdot atm/mol \cdot K$
		$= 8.48 \times 10^4\,g \cdot cm/mol \cdot K$
Planck's constant	h	$6.626 \times 10^{-34}\,J \cdot s$
Speed of light in vacuum	c	$2.997 \times 10^8\,m/s$

Universal constants for William Landel Ferry: C_1=17.44 and C_2=51.6.