

## PHYSICAL CONSTANTS (cgs)<sup>7</sup>

Physical Quantity	Symbol	Value	Units
Boltzmann constant	$k$	$1.3807 \times 10^{-16}$	erg/deg (K)
Elementary charge	$e$	$4.8032 \times 10^{-10}$	statcoulomb (statcoul)
Electron mass	$m_e$	$9.1094 \times 10^{-28}$	g
Proton mass	$m_p$	$1.6726 \times 10^{-24}$	g
Gravitational constant	$G$	$6.6726 \times 10^{-8}$	dyne-cm <sup>2</sup> /g <sup>2</sup>
Planck constant	$h$	$6.6261 \times 10^{-27}$	erg-sec
	$\hbar = h/2\pi$	$1.0546 \times 10^{-27}$	erg-sec
Speed of light in vacuum	$c$	$2.9979 \times 10^{10}$	cm/sec
Proton/electron mass ratio	$m_p/m_e$	$1.8362 \times 10^3$	
Electron charge/mass ratio	$e/m_e$	$5.2728 \times 10^{17}$	statcoul/g
Rydberg constant	$R_\infty = \frac{2\pi^2 me^4}{ch^3}$	$1.0974 \times 10^5$	cm <sup>-1</sup>
Bohr radius	$a_0 = \hbar^2/me^2$	$5.2918 \times 10^{-9}$	cm
Atomic cross section	$\pi a_0^2$	$8.7974 \times 10^{-17}$	cm <sup>2</sup>
Classical electron radius	$r_e = e^2/mc^2$	$2.8179 \times 10^{-13}$	cm
Thomson cross section	$(8\pi/3)r_e^2$	$6.6525 \times 10^{-25}$	cm <sup>2</sup>
Compton wavelength of electron	$h/m_e c$	$2.4263 \times 10^{-10}$	cm
	$\hbar/m_e c$	$3.8616 \times 10^{-11}$	cm
Fine-structure constant	$\alpha = e^2/\hbar c$	$7.2974 \times 10^{-3}$	
	$\alpha^{-1}$	137.04	
First radiation constant	$c_1 = 2\pi hc^2$	$3.7418 \times 10^{-5}$	erg-cm <sup>2</sup> /sec
Second radiation constant	$c_2 = hc/k$	1.4388	cm-deg (K)
Stefan-Boltzmann constant	$\sigma$	$5.6705 \times 10^{-5}$	erg/cm <sup>2</sup> -sec-deg <sup>4</sup>
Wavelength associated with 1 eV	$\lambda_0$	$1.2398 \times 10^{-4}$	cm

Physical Quantity	Symbol	Value	Units
Frequency associated with 1 eV	$\nu_0$	$2.4180 \times 10^{14}$	Hz
Wave number associated with 1 eV	$k_0$	$8.0655 \times 10^3$	$\text{cm}^{-1}$
Energy associated with 1 eV		$1.6022 \times 10^{-12}$	erg
Energy associated with $1 \text{ cm}^{-1}$		$1.9864 \times 10^{-16}$	erg
Energy associated with 1 Rydberg		13.606	eV
Energy associated with 1 deg Kelvin		$8.6174 \times 10^{-5}$	eV
Temperature associated with 1 eV		$1.1604 \times 10^4$	deg (K)
Avogadro number	$N_A$	$6.0221 \times 10^{23}$	$\text{mol}^{-1}$
Faraday constant	$F = N_A e$	$2.8925 \times 10^{14}$	statcoul/mol
Gas constant	$R = N_A k$	$8.3145 \times 10^7$	erg/deg-mol
Loschmidt's number (no. density at STP)	$n_0$	$2.6868 \times 10^{19}$	$\text{cm}^{-3}$
Atomic mass unit	$m_u$	$1.6605 \times 10^{-24}$	g
Standard temperature	$T_0$	273.15	deg (K)
Atmospheric pressure	$p_0 = n_0 k T_0$	$1.0133 \times 10^6$	dyne/cm <sup>2</sup>
Pressure of 1 mm Hg (1 torr)		$1.3332 \times 10^3$	dyne/cm <sup>2</sup>
Molar volume at STP	$V_0 = R T_0 / p_0$	$2.2414 \times 10^4$	cm <sup>3</sup>
Molar weight of air	$M_{\text{air}}$	28.971	g
calorie (cal)		$4.1868 \times 10^7$	erg
Gravitational acceleration	$g$	980.67	cm/sec <sup>2</sup>