

APPENDIX -3

Physical Constants

Quantity	Symbol	Traditional Units	SI Units
Acceleration of gravity	g	980.6 cm s ⁻¹	9.806 m s ⁻¹
Atomic mass unit (1/12 th of the mass of ¹² C atom)	amu or u	1.6606 × 10 ⁻²⁴ g	1.6606 × 10 ⁻²⁷ kg
Avogadro constant	N _A	6.022 × 10 ²³ particles mol ⁻¹	6.022 × 10 ²³ particles mol ⁻¹
Bohr radius	a ₀	0.52918 Å ⁰	5.2918 × 10 ⁻¹¹ m 5.2918 × 10 ⁻⁹ cm
Boltzmann constant	k	1.3807 × 10 ⁻¹⁶ erg K ⁻¹	1.3807 × 10 ⁻²³ J K ⁻¹
Charge-to-mass ratio of electron	e / m	1.7588 × 10 ⁸ coulomb g ⁻¹	1.7588 × 10 ¹¹ C kg ⁻¹
Electronic charge	e	1.60219 × 10 ⁻¹⁹ coulomb 4.8033 × 10 ⁻¹⁹ esu	1.60219 × 10 ⁻¹⁹ C
Electron rest mass	m _e	9.10952 × 10 ⁻²⁸ g 0.00054859 u	9.10952 × 10 ⁻³¹ kg
Faraday constant	F	36,487 coulombs eq ⁻¹ 23.06 kcalvolt ⁻¹ eq ⁻¹	96,487 C (mol e ⁻) ⁻¹ 36,487 J V ⁻¹ .(mol e ⁻) ⁻¹
Gas constant	R	0.8206 Latmmol ⁻¹ K ⁻¹ 1.987 calmol ⁻¹ K ⁻¹	8.3145 kPa dm ³ mol ⁻¹ K ⁻¹ 8.3145 J mol ⁻¹ K ⁻¹
Molar volume (STP)	V _m	22.710981 L mol ⁻¹	22.710981 × 10 ⁻³ m ³ mol ⁻¹ 22.710981 dm ³ mol ⁻¹
Neutron rest mass	m _n	1.67495 × 10 ⁻²⁴ g 1.008665 u	1.67495 × 10 ⁻²⁷ kg
Planck constant	h	6.6262 × 10 ⁻²⁷ ergs	6.6262 × 10 ⁻³⁴ J s
Proton rest mass	m _p	1.6726 × 10 ⁻²⁴ g 1.007277 u	1.6726 × 10 ⁻²⁷ kg
Rydberg constant	R	3.089 × 10 ¹⁵ cycles s ⁻¹ 2.1799 × 10 ⁻¹¹ erg	1.0974 × 10 ⁷ m ⁻¹ 2.1799 × 10 ⁻¹⁸ J
Speed of light (in vacuum)	c	2.9979 × 10 ¹⁰ cm s ⁻¹ (186,281 mile second ⁻¹)	2.9979 × 10 ⁸ m s ⁻¹

$$\pi = 3.1416 \quad 2.303 R = 4.576 \text{ calmol}^{-1} \quad K = 19.15 \text{ J mol}^{-1} \text{ K}^{-1}$$

$$e = 2.71828 \quad 2.303 RT \text{ (at } 25^{\circ}\text{C)} - 1364 \text{ cal mol}^{-1} = 5709 \text{ J mol}^{-1}$$

$$\ln X = 2.303 \log X$$