

EE 381 Constants and conversion factors

Constants

Name	Symbol	Value
speed of light in vacuum	c	$2.99792458 \times 10^8 \text{ m/s}$
permittivity of free space	ϵ_0	$8.8541878128 \times 10^{-12} \text{ F/m}$
permeability of free space	μ_0	$4\pi \times 10^{-7} \text{ H/m}$
intrinsic impedance of free space	η_0	376.7303134126Ω
acceleration due to gravity	g	9.80665 m/s^2
electron charge	e^-	$-1.602176634 \times 10^{-19} \text{ C}$
electron charge magnitude	e	$1.602176634 \times 10^{-19} \text{ C}$
free electron rest mass	m_0	$9.1093837015 \times 10^{-31} \text{ kg}$
proton charge	p^+	$1.602176634 \times 10^{-19} \text{ C}$
proton rest mass	M or m_p	$1.6726219237 \times 10^{-27} \text{ kg}$
neutron mass	m_n	$1.6749275006 \times 10^{-27} \text{ kg}$
Boltzmann's constant	k_B	$1.380649 \times 10^{-23} \text{ J/K} = 8.617333 \times 10^{-5} \text{ eV/K}$
Avogadro's number	N_A	$6.02214076 \times 10^{23} \text{ mol}^{-1}$ or $\sim \text{nucleons/g} = \text{atoms} \cdot \text{AtWt/g}$
Planck's constant	h	$6.62607015 \times 10^{-34} \text{ J/Hz or J}\cdot\text{s}$ $= 4.1356677 \times 10^{-15} \text{ eV/Hz or eV}\cdot\text{s}$
Reduced/Modified Planck's constant	$\hbar = h/2\pi$	$1.054571817 \times 10^{-34} \text{ J/Hz or J}\cdot\text{s}$ $= 6.58211957 \times 10^{-16} \text{ eV/Hz or eV}\cdot\text{s}$

Conversions

Description	Value
mils to inches to meters	$1 \text{ mil} = 0.001 \text{ in.} = 25.4 \mu\text{m}$
inches to cm to m	$1 \text{ in.} = 2.54 \text{ cm} = 0.0254 \text{ m}$
foot to m	$1 \text{ ft} = 0.3048 \text{ m}$
yd to m	$1 \text{ yd} = 0.9144 \text{ m}$
Angstrom to meters	$1 \text{ \AA} = 1 \times 10^{-10} \text{ m}$
Electronvolts to Joules	$1 \text{ eV} = 1.602176634 \times 10^{-19} \text{ J}$