List of Constants

Electron charge	$e = 1.60 \times 10^{-19}\, C$
Speed of light	$c = 3 \times 10^{8}\, m \cdot s^{-1}$
Boltzmann constant	$k = 1.38 \times 10^{-23}\, J / K$
Avogadro number	$N_A = 6.022 \times 10^{23}\, molecules/mole$
Gas constant	$R = 8.314\ J / (K \cdot mole)$
Electron mass	$m_e = 9.11 \times 10^{-31}\, kg$ $= 0.511\, MeV/c^2$
Proton mass	$m_p = 1.67 \times 10^{-27}\, kg$ $= 938\, MeV/c^2$
Neutron mass	$m_n = 940\, MeV/c^2$
Coulomb law constant	$1/(4\pi\epsilon_0) = 9 \times 10^{9}\, N \cdot m^2 / C^2$
Atomic mass units conversion factor	$1\, u = 1.66 \times 10^{-27}\, kg$
Acceleration due to earth's gravity	$g = 9.80\, m/s^2$
Powers	$m = 10^{-3}$; $\mu = 10^{-6}$; $n = 10^{-9}$ $M = 10^{6}$

Useful formulae

Maxwell speed distribution:

$$n(v) = N\left(\frac{m}{2kT}\right)^{3/2} e^{-mv^2/(2kT)}(4\pi v^2)$$

where $\bar{v} = \sqrt{\frac{8kT}{\pi m}}$ and $v_{rms} = \sqrt{\frac{3kT}{m}}$.

Lorentz transformation law for space-time with relative motion in the x-direction:

$$t' = \gamma\left(t - \frac{v}{c^2}x\right) \qquad x' = \gamma(x - vt) \qquad y' = y \qquad z' = z$$

The combinations (ct, x, y, z) and $(E/c, p_x, p_y, p_z)$ transform as four-vectors.

Lorentz transformation law for velocity components:

$$u_x' = \frac{u_x - v}{1 - (v/c^2)u_x} \qquad u_y' = \frac{u_y}{\gamma\left[1 - (v/c^2)u_x\right]} \qquad u_z' = \frac{u_z}{\gamma\left[1 - (v/c^2)u_x\right]}$$