

BASIC FORMULAS - ATOMS AND NUCLEI

All symbols have their usual meanings, defined in the text.

Mass-energy: $E = mc^2$... (1.1)

Relativistic factor: $\gamma = \frac{1}{\sqrt{1 - \frac{v^2}{c^2}}}$... (1.3)

Relativistic mass: $m = \gamma m_0$... (1.2)

Kinetic energy: $K = (\gamma - 1)E_0$... (1.4)

Momentum: $p = mv = \gamma m_0 v$... (1.5)

Photon: $E = hf$... (1.6)

Light: $p = \frac{hf}{c}$... (1.8)

De Broglie relation: $\lambda = \frac{h}{p}$... (1.9)

Decay: $N = N_0 e^{-\lambda t}$... (3.2)

Activity: $R = -\frac{dN}{dt} = \lambda N$... (3.3)

Decay constant and half-life: $\lambda \tau = \ln(2)$... (3.5)

Attenuation: $N(x) = N_0 e^{-\mu_l x}$... (4.1)

Half thickness: $x_{1/2} = \frac{\ln(2)}{\mu_l} = \ln(2)\lambda = 0.693\lambda$... (4.2)

Attenuation coefficients: $\mu_l = \mu_m \rho$... (4.3)

Absorbed dose: $D = \frac{E}{m}$... (5.1)