Beer–Lambert law (or Beer–Lambert–Bouguer law)

The absorbance of a beam of collimated monochromatic radiation in a homogeneous isotropic medium is proportional to the absorption path-length, l, and to the concentration, c, or — in the gas phase — to the pressure of the absorbing species. The law can be expressed as:

$$A = \log_{10} (P_\lambda^0 / P_\lambda) = \varepsilon c l$$

or

$$P_\lambda = P_\lambda^0 10^{-\varepsilon c l}$$

where the proportionality constant, ε, is called the molar (decadic) absorption coefficient. For l in cm and c in mol dm^{-3} or M, ε will result in dm^3 mol^{-1} cm^{-1} or M cm^{-1}, which is a commonly used unit. The SI unit of ε is m^2 mol^{-1}. Note that spectral radiant power must be used because the Beer–Lambert law holds only if the spectral bandwidth of the light is narrow compared to spectral linewidths in the spectrum.

See *absorbance, extinction coefficient, Lambert law.*

1996, *68*, 2230; see also 1988, *60*, 1452; 1990, *62*, 2176