

DUAL NATURE OF RADIATION AND MATTER

(1). Einstein's photoelectric equation, $h\nu - \phi = hf_0$

Where ν, f_0 are frequencies of incident radiation.

(2). Work function and threshold frequency or threshold wavelength, $\phi = h\nu_0 = \frac{hc}{\lambda_0}$

(3). Energy of photon, $E = h\nu = \frac{hc}{\lambda}$ Momentum of photon, $p = \frac{h\nu}{c} = \frac{h}{\lambda}$

(4). De Broglie wavelength of a material particle, $\lambda = \frac{h}{mv}$

(5). De Broglie wavelength of an electron accelerated through a potential V volt,

$$\lambda = \frac{12.27}{\sqrt{V}} \text{ nm}$$

(7). De Broglie wavelength of a particle in terms of temperature $\lambda = \frac{h}{\sqrt{2mkT}}$

(13). De Broglie wavelength in terms of energy of a particle (E), $\lambda = \frac{h}{\sqrt{2mE}}$