



Einstein's Photo Electric Equation

Einstein's Photo electric equation:

Let ν = frequency of incident light

E = Energy of the incident light = $h\nu$

h = Planck's constant = 6.625×10^{-34} Joule Sec

E_0 = Work function of the emitting electrode

For emission of electron the necessary condition $E \gg E_0$

$$E_0 = h\nu_0$$

$$\therefore h\nu \geq h\nu_0$$

$$\nu \geq \nu_0$$

Thus for emission of photo electron the frequency of incident light ν must be greater than or equal to ν_0 hence ν_0 is the threshold frequency.

Let $E > E_0$

$E - E_0$ = The maximum kinetic energy of the photo electron = $\frac{1}{2}mv_{\max}^2$

$$\text{or } h\nu - h\nu_0 = \frac{1}{2}mv_{\max}^2$$

$$h\nu - h\nu_0 = eV_s$$

$$\nu - \nu_0 = \frac{e}{h}V_s$$

$$\nu = \nu_0 + \frac{e}{h}V_s$$