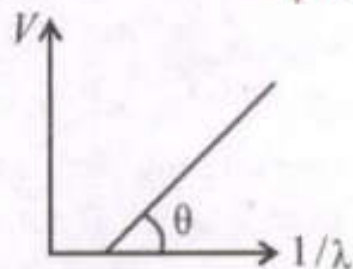


- Q 4.** In a photoelectric effect experiment, the graph of stopping potential V versus reciprocal of wavelength obtained is shown in the figure. As the intensity of incident radiation is increased :

[Main Sep. 04, 2020 (II)]



- (a) Straight line shifts to right
- (b) Slope of the straight line get more steep
- (c) Straight line shifts to left
- (d) Graph does not change

Ans

(d) According to Einstein's photoelectric equation

$$K_{\max} = h\nu - \phi_0 \Rightarrow eV_s = \frac{hc}{\lambda} - \phi_0$$

$$\Rightarrow V_s = \frac{hc}{\lambda e} - \frac{\phi_0}{e} \quad \text{where } \lambda = \text{wavelength of incident light}$$

ϕ_0 = work function

V_s = stopping potential

Comparing the above equation with $y = mx + c$, we get slope = $\frac{hc}{e}$

Increasing the frequency of incident radiation has no effect on work function and frequency. So, graph will not change.