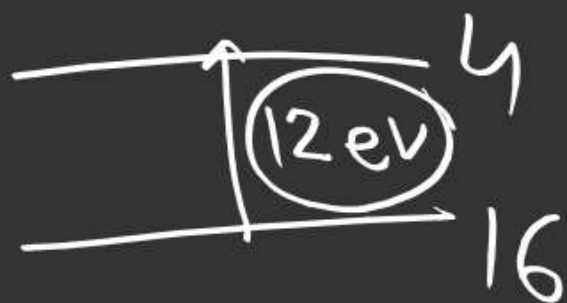


$$KE = \left(\frac{13.6}{n^2} \right) Z^2$$

$$\log \frac{13.6}{n^2} = \log_{10} 3.4$$

$$\frac{13.6}{n^2} = 3.4$$

$$n = 2$$



19

$$13.6 \text{ eV}$$

$$\frac{30 \text{ W}}{13.6 \text{ eV}}$$

$$13.6 \times 4 \text{ eV}$$

21

$$E_n = -13.6 Z^2 \frac{1}{n^2}$$

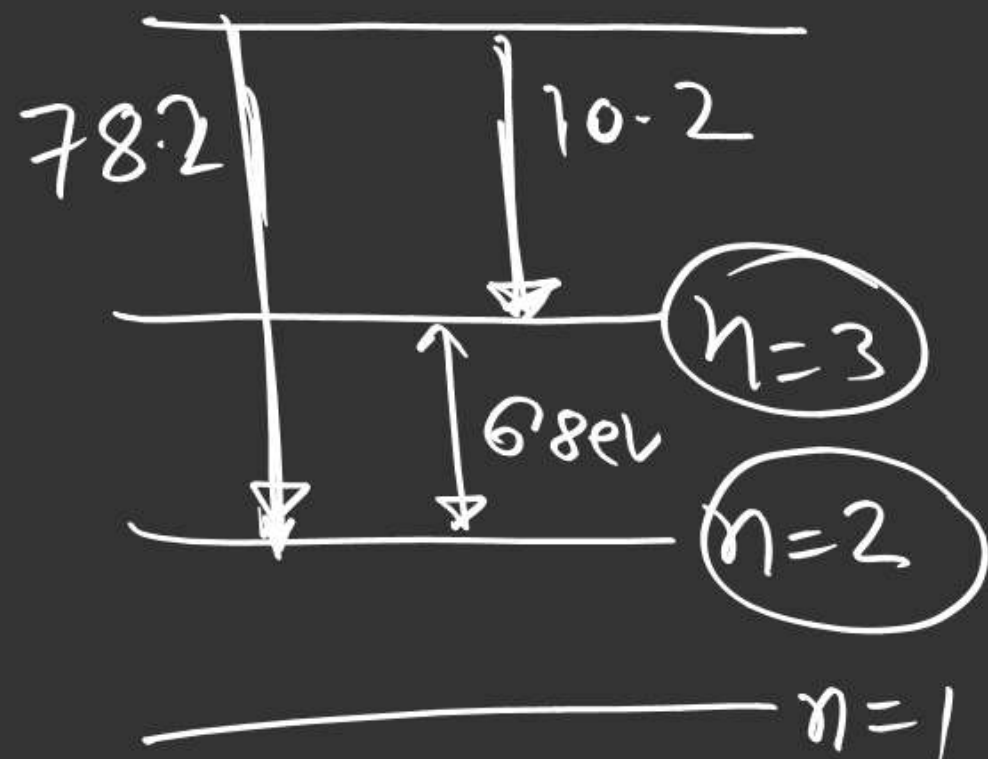
$$E_1 = -13.6 Z^2$$

$$E_n = \frac{E_1}{n^2} = \frac{16}{n^2}$$

$$(26) - 10^{-8} \text{ sec} \times f$$

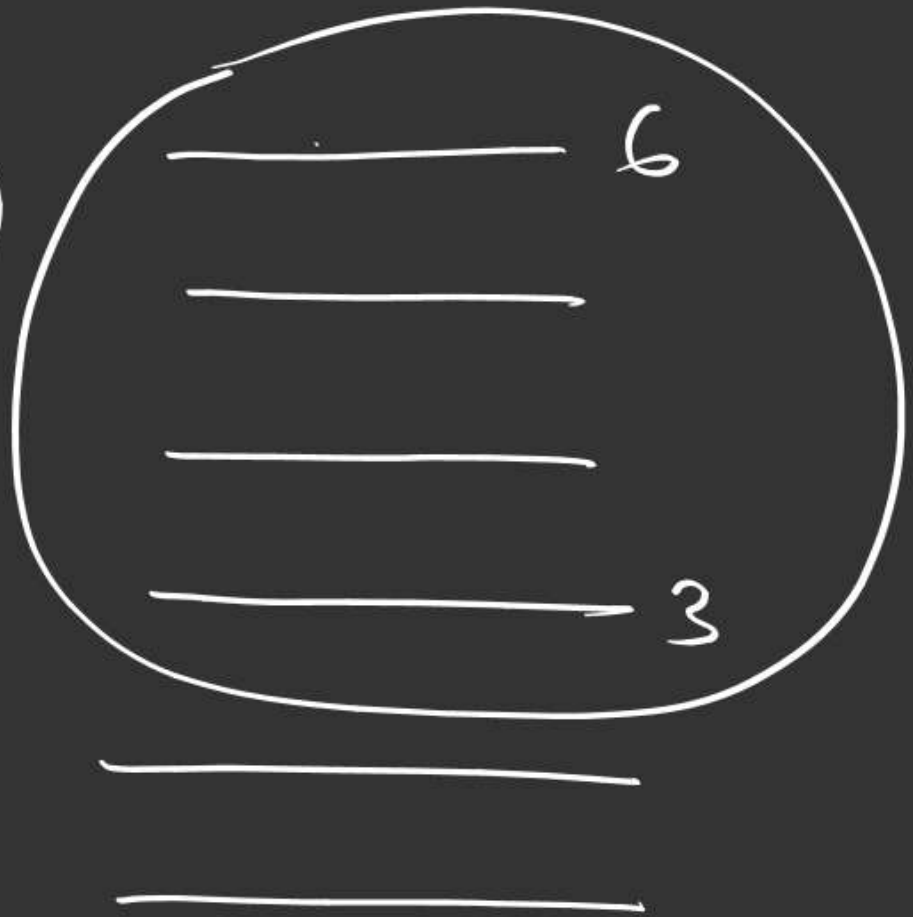
$$\rightarrow 10^{-8} \text{ sec} \times \left(\frac{v}{2\pi r} \right)$$

(27)



$$6.8 \text{ eV} = 13.6 Z^2 \left[\frac{1}{4} - \frac{1}{9} \right]$$

(29)



(33)



$$\frac{3(3-1)}{2}$$

(34)

$$\frac{1240 \text{ nm} \cdot \text{eV}}{102.6 \text{ nm}}$$

$$\underline{\underline{12.09 \text{ eV}}}$$

(35)

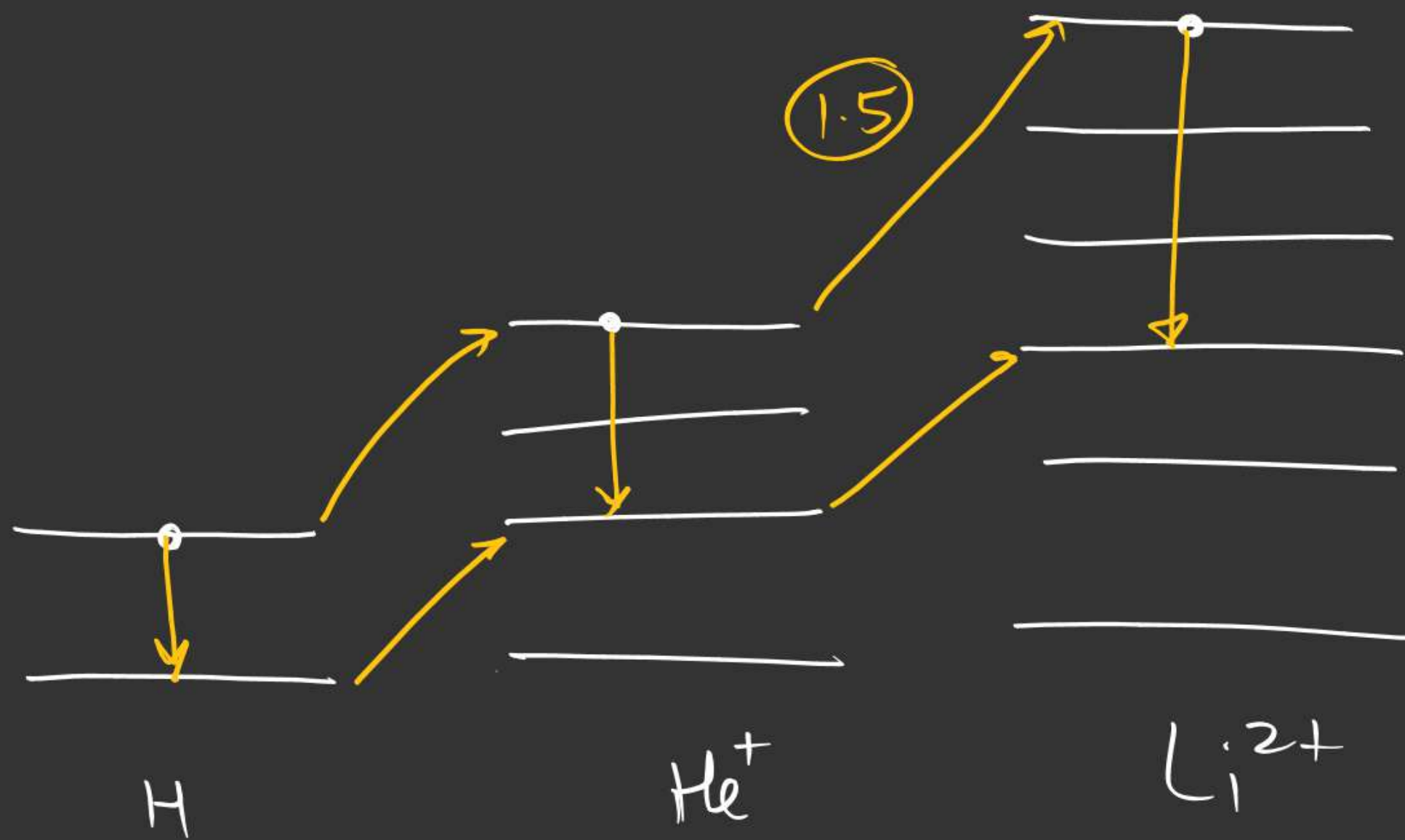
_____ n_2 .

_____ n_1

$$\frac{3}{4} \times 0.85 = 13.6 \left[\frac{1}{n_1^2} - \frac{1}{n_2^2} \right]$$

$$\frac{3}{4} \times \frac{\cancel{13.6}}{16} = \cancel{13.6} \left[\frac{1}{n_1^2} - \frac{1}{n_2^2} \right]$$

$$\frac{1}{16} - \frac{1}{64}$$

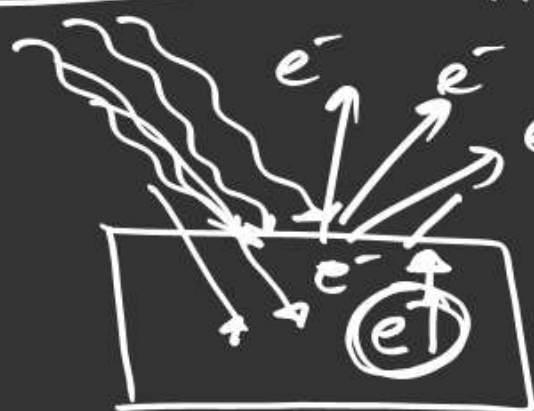


(iii)

It could not explain the ability of atoms to form molecules by chemical bonds.



photoelectric effect : \rightarrow Ejection of electrons from a metal when it is exposed to light (or radiation)



Metal

$$E = h\nu$$

Energy of the incident photon must be greater than threshold energy (w or ϕ) [work function] to eject an e^-

$$0 < KE \leq KE_{\max}$$

Ejected e^- may have KE from 0 to KE_{\max}

$$KE_{\max} = h\nu - w$$

$$\textcircled{KE_{\max}} = h\nu - h\nu_0 \leftarrow \text{Threshold frequency}$$

$$= \frac{hc}{\lambda} - \frac{hc}{\lambda_0} \leftarrow \text{Threshold wavelength}$$

$$\frac{1}{2}mv^2 = \textcircled{KE_{\max}} = \underline{h\nu} - w$$

Intensity = energy per unit area
per unit time

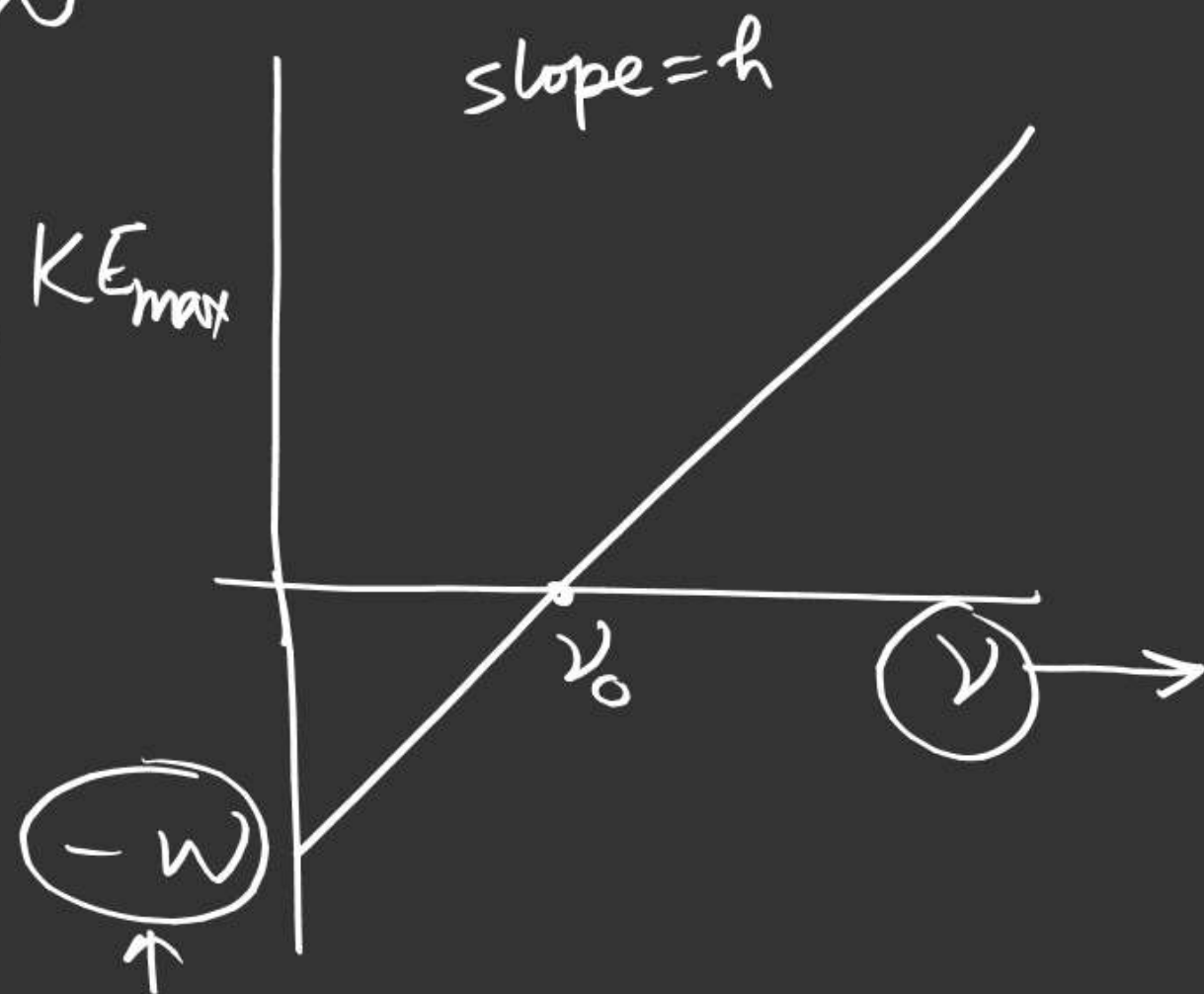
Acc to wave theory

Intensity \propto (amplitude)²

Acc to particle nature of light

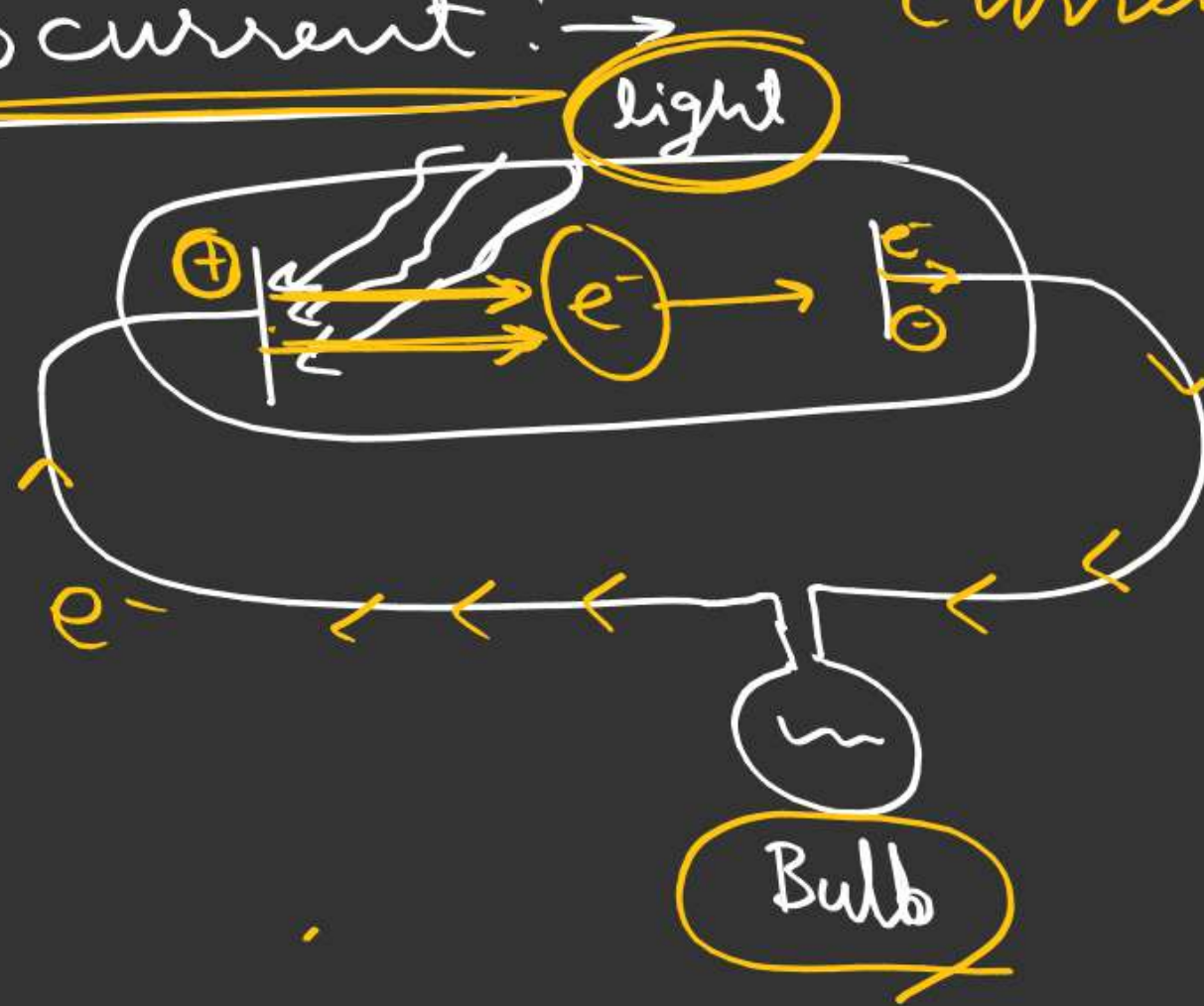
Intensity \propto energy of single photon (ν)

\propto no. of photons per sec per unit area
(photo intensity)



$K E_{\max}$ of ejected e^- depends on frequency of incident light and is independent of photo-intensity.

\Rightarrow photocurrent:



Current produced by photoelectrons is known as photocurrent

photocurrent depends on photointensity and is independent of frequency of light used

