

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

(19)

13.6 eV

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

13.6  $\times$  4 eV

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

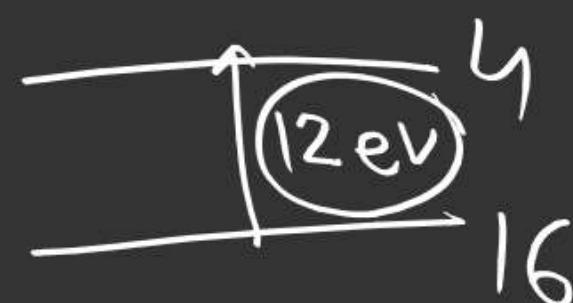
$$\frac{13.6}{n^2} = 3.4$$

$$n = 2$$



$$(21) E_n = -13.6 Z^2 \frac{1}{n^2}$$

$$E_1 = -13.6 Z^2$$

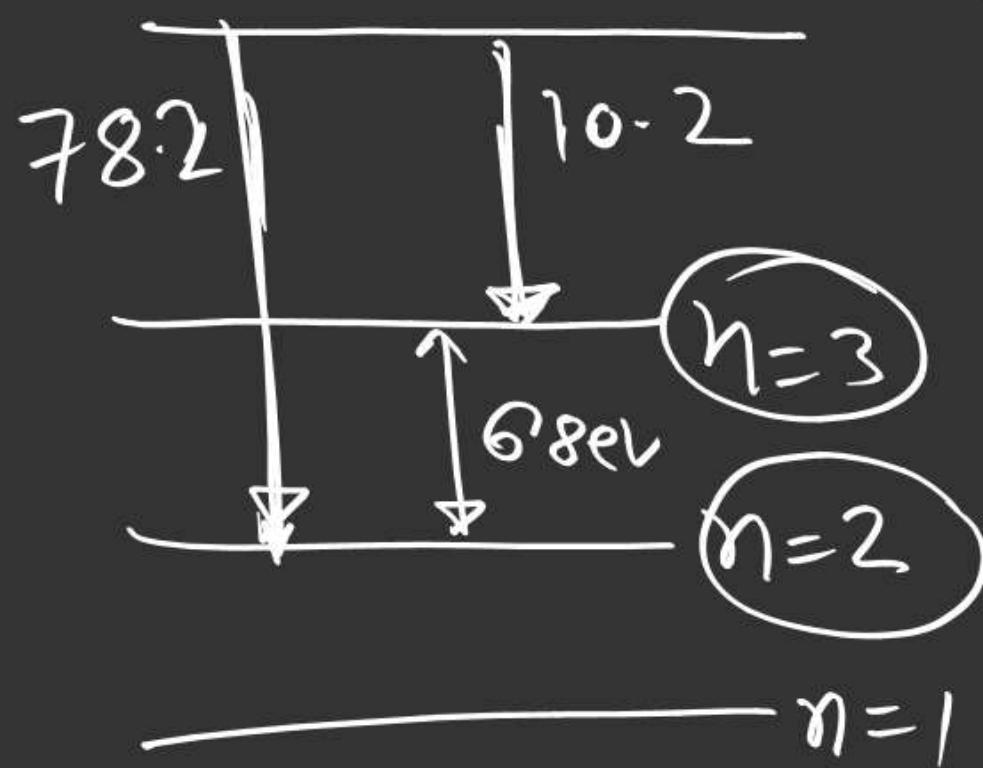


$$E_n = \frac{E_1}{n^2} = \frac{16}{n^2}$$

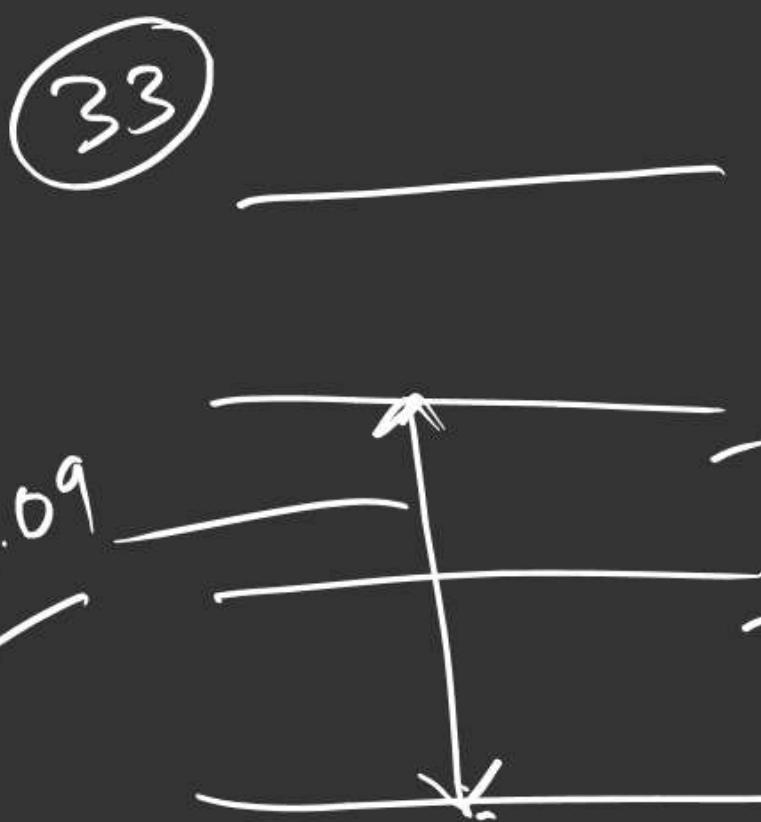
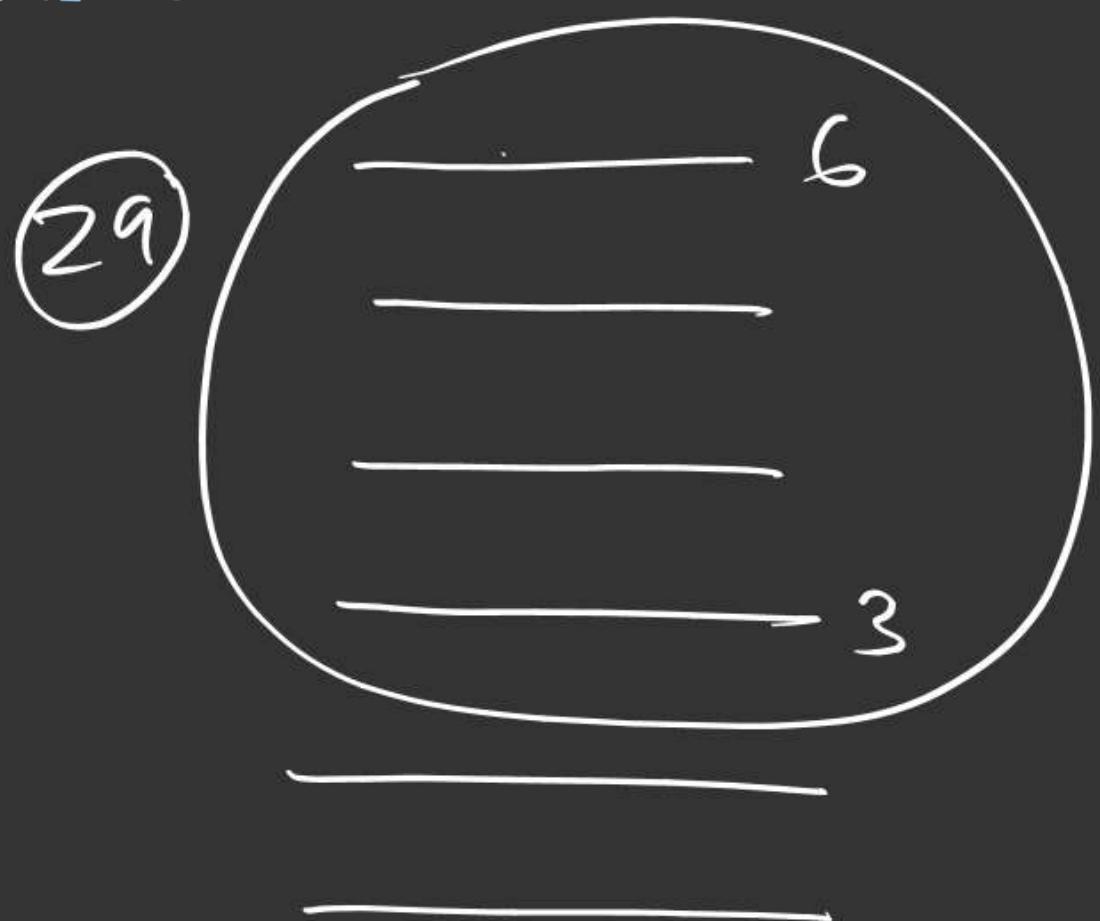
$$\textcircled{26} - 10^{-8} \text{ sec} \times f$$

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

\textcircled{27}

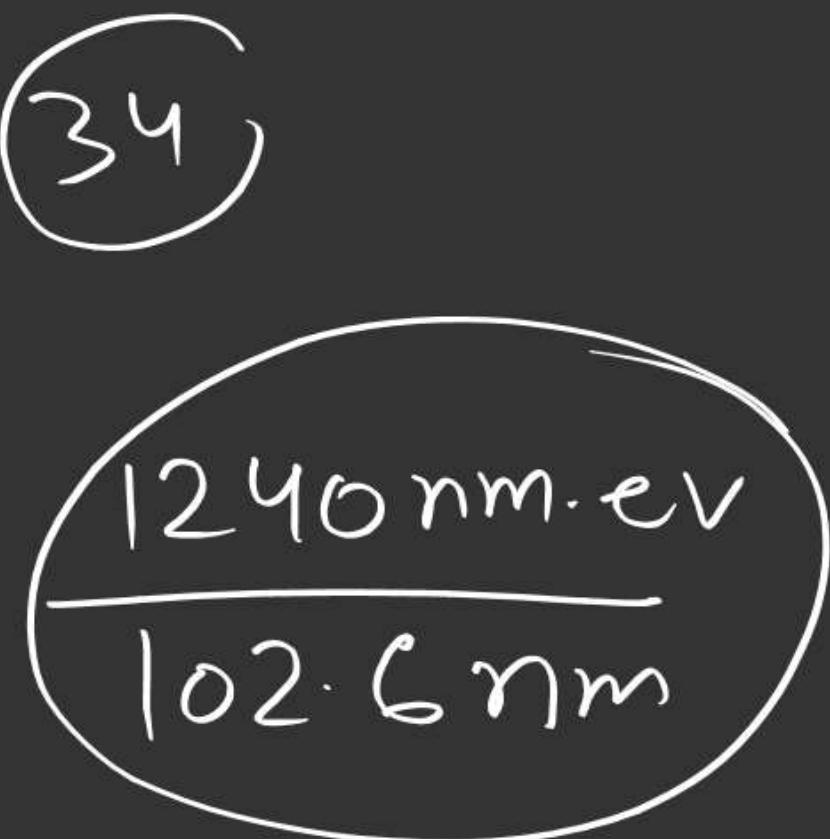


$$68 \text{ eV} = 13.6 Z^2 \left[ \frac{1}{4} - \frac{1}{9} \right]$$



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

$-1.51$   
 $-3.4$   
 $-13.6$



$$\frac{12.09 \text{ ev}}{2}$$

(35)

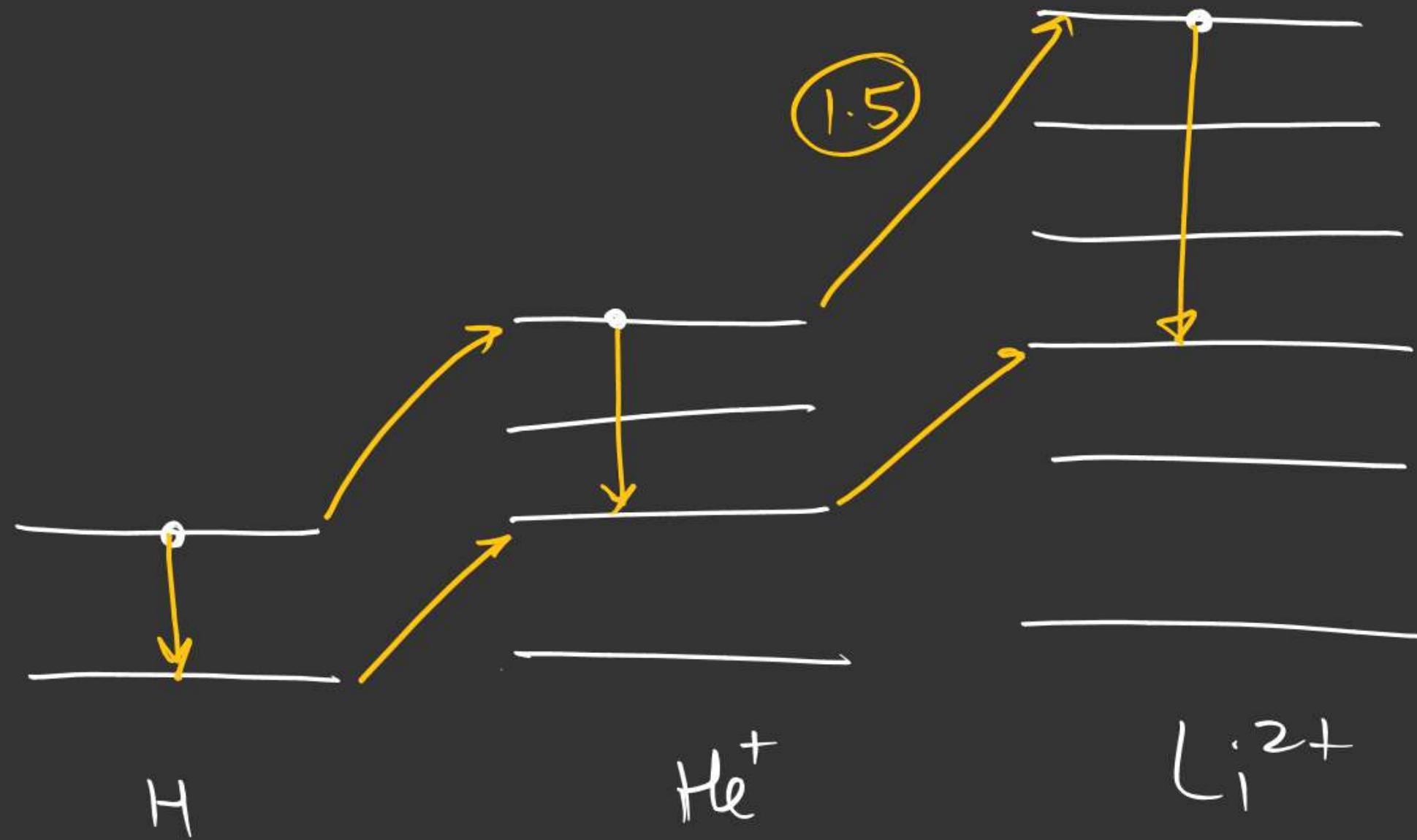
$$\frac{3}{4} \times 0.85 = 13.6 \left[ \frac{1}{n_1^2} - \frac{1}{n_2^2} \right]$$

$n_2$ .

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

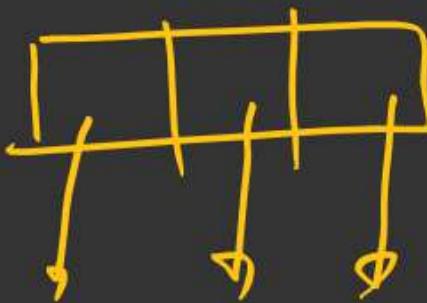
$n_1$

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

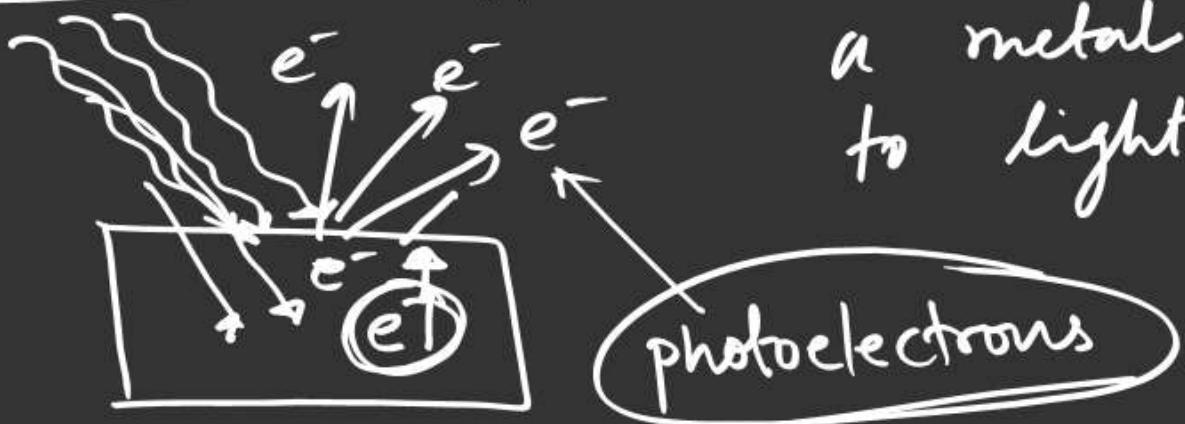


(iii)

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



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



Metal

$$E = h\nu$$

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

Energy of the incident photon must be greater than threshold energy ( $w$  or  $\phi$ ) [work function]

to eject an  $e^-$

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

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

$$\begin{aligned} KE_{\max} &= h\nu - h\nu_0 && \text{Threshold frequency} \\ &= \frac{hc}{\lambda} - \frac{hc}{\lambda_0} && \text{Threshold Wavelength} \end{aligned}$$

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

slope = h

Intensity = energy per unit area  
per unit time  $\overset{KE_{\max}}{\curvearrowleft}$

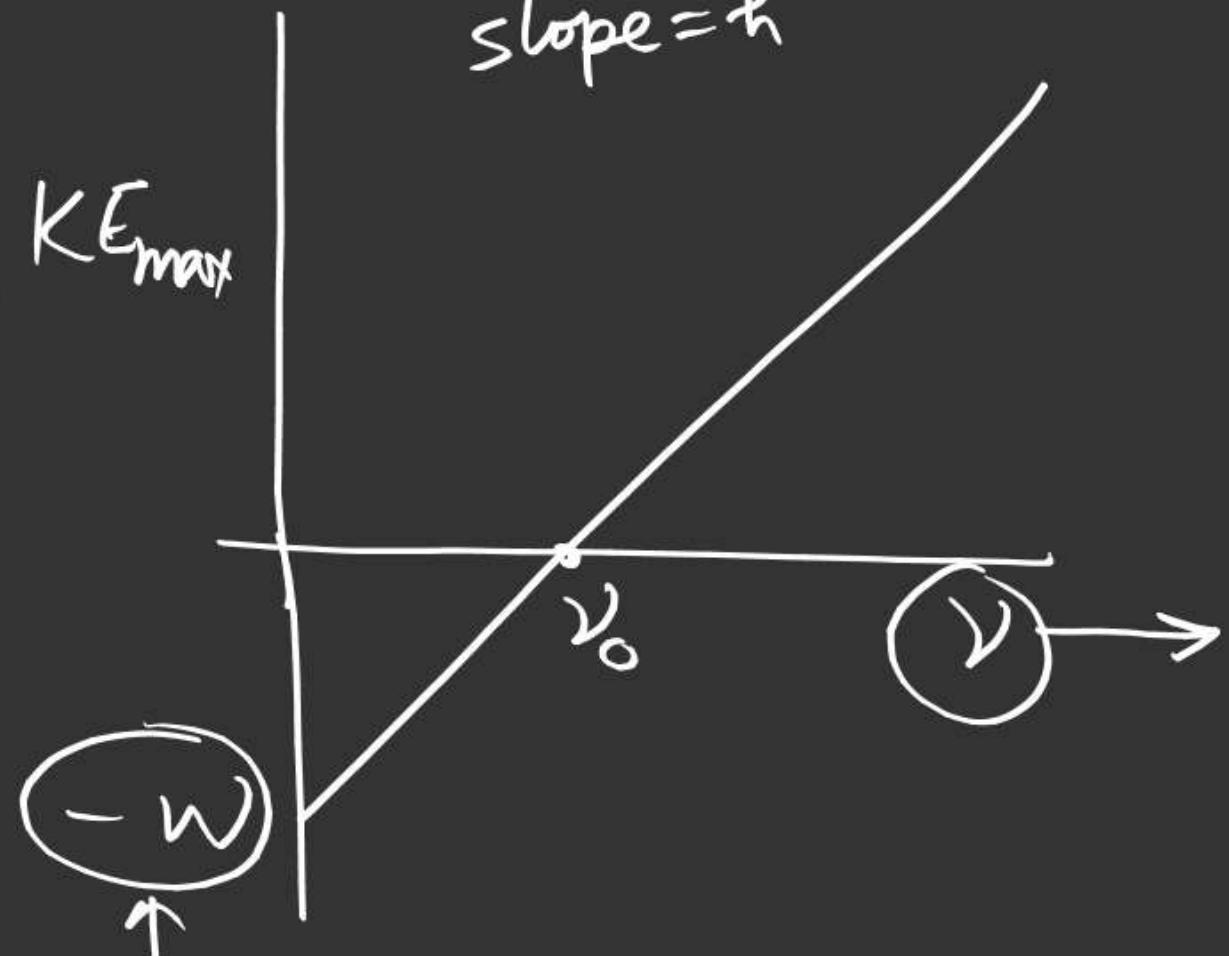
Acc to wave theory

$$\text{Intensity} \propto (\text{amplitude})^2$$

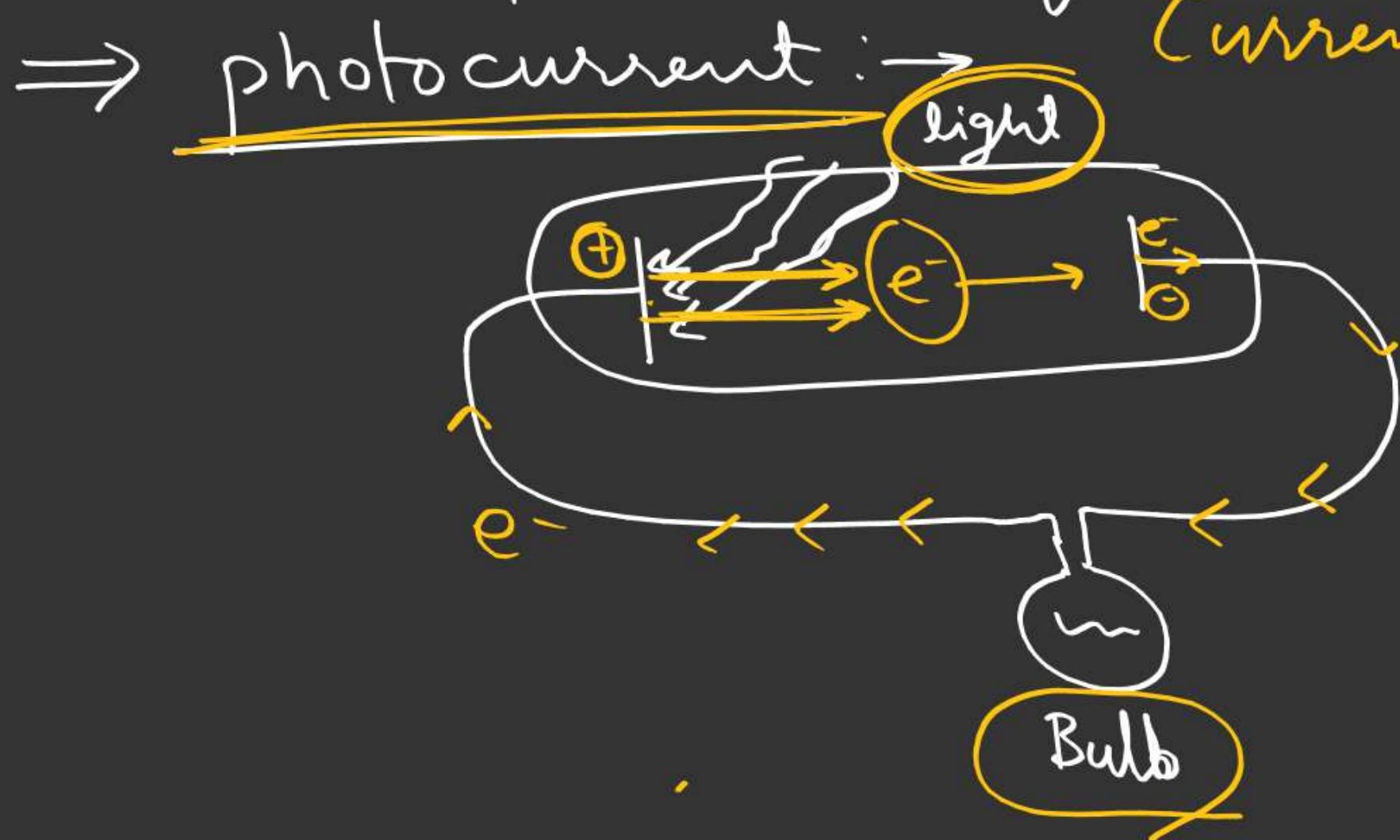
Acc to particle nature of light

Intensity  $\propto$  energy of single photon ( $v$ )

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



K E<sub>max</sub> of ejected  $e^-$  depends on frequency of incident light and is independent of photo-intensity.



Current produced by photoelectrons is known as photo current

photo current depends on photo intensity and is independent of frequency of light used

O-I 30 - 36

S-I 37 - 40

O-II 1 - 10

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