

Effet photoelectrique

* Définitions.

* Il y a émission effet photo-electrique si $\lambda \leq \lambda_0$

$$* W_0 = h\nu_0 = \frac{hc}{\lambda_0}$$

$$\Rightarrow \lambda_0 = \frac{hc}{W_0} = \frac{c}{\nu_0}$$

$$* W = \frac{hc}{\lambda} \Rightarrow \lambda = \frac{hc}{W}$$

$$* | E_{\text{max}} = eU_0 | \quad \text{ou} \quad | E_{\text{max}} = W - W_0 | \quad \underline{\underline{150}}$$

$$* E_{\text{max}} = \frac{1}{2} m v_{\text{max}}^2 \Rightarrow | v_{\text{max}} = \sqrt{\frac{2 E_{\text{max}}}{m}} |$$

$$\bullet \frac{1}{2} m v_{\text{max}}^2 = eU_0 \quad \text{ou} \quad \frac{1}{2} m v_{\text{max}}^2 = W - W_0$$

$$\Rightarrow | v_{\text{max}} = \sqrt{\frac{2 e U_0}{m}} |$$

$$\text{ou} \quad | v_{\text{max}} = \sqrt{\frac{2(W - W_0)}{m}} |$$

Rmq: $V_c = v_{\text{max}}$ (vitese cathode)

$$* | V_A = \sqrt{V_c^2 + \frac{2 e U_0}{m}} |$$

Rendement

$$R = \frac{n}{n'} \rightarrow \begin{array}{l} \text{nbre d'électrons} \\ \text{nbre de photons} \end{array}$$

$$n = \frac{I_s t}{e} \quad \text{par seconde} \quad n = \frac{I_s}{e}$$

$$n' = \frac{P t h}{h c} \quad \text{par seconde} \quad n' = \frac{P h}{h c}$$

$$1 \text{ eV} \rightarrow 1,6 \cdot 10^{-19} \text{ J}$$

$$1 \text{ MeV} \rightarrow 10^6 \text{ eV} = 1,6 \cdot 10^{-13} \text{ J}$$