№ 5.293

Дано:

$\lambda_1 = 0,35$ мкм

$\lambda_2 = 0,54$ мкм

$\eta = 2$

$A_{вых} - ?$

Решение:

$$E \frac{hc}{\lambda_1} = A_{вых} + \frac{mV_{max}^2}{2} \implies$$

$$A_{вых} = \frac{hc}{\lambda} - \frac{mV_{max}^2}{2}, \quad \frac{V_1}{V_2} = \eta$$

$$\frac{hc}{\lambda_1} - \frac{m(\eta V_{max_1})^2}{2} = \frac{hc}{\lambda_2} - \frac{mV_{max_2}^2}{2}$$

$$2(E_2 - E_1) = m\left(V_{m_2}^2 - 2V_{m_1}^2\right), \quad E = \frac{hc}{\lambda}$$

$$2hc\left(\frac{\lambda_1 - \lambda_2}{\lambda_1 \lambda_2}\right) = -3mV_{max_2}^2$$

$$V_{max_2}^2 = \frac{2hc}{3m}\left(\frac{\lambda_2 - \lambda_1}{\lambda_1 \cdot \lambda_2}\right)$$

$$A = \frac{hc}{\lambda_2} - \frac{\not{m} \cdot \dfrac{2hc}{3\not{m}}\left(\dfrac{\lambda_2 - \lambda_1}{\lambda_1 \cdot \lambda_2}\right)}{2} = \frac{hc}{\lambda_2}$$

$$\equiv hc\left(\frac{1}{\lambda_2} - \frac{1}{3}\left(\frac{\lambda_2 - \lambda_1}{\lambda_2 \cdot \lambda_1}\right)\right) \approx 12 \, \text{эВ}$$

N° 5.308

Дано:

$T_{\text{макс}} \approx 0,9 \, \text{МэВ}$

$\lambda_{\kappa} - ?$

Решение:

$$\theta = 180°$$

$$\Delta\lambda = \lambda' - \lambda_{\kappa} = \lambda_c(1 - \cos\theta)$$

$$\frac{h}{m_e c} \approx 2,4 \cdot 10^{-12} \, \text{м}$$

$$\lambda' - \lambda_{\kappa} = 2\lambda_c$$

$$\left.\begin{array}{l} \lambda' = 2\lambda_c + \lambda_{\kappa} \\ \varepsilon = \varepsilon' + T \end{array}\right\} \Rightarrow \frac{hc}{\lambda_{\kappa}} = \frac{hc}{2\lambda_c + \lambda_{\kappa}} + T \quad \left|\cdot \frac{\lambda_{\kappa}}{hc}\right.$$

$$\lambda_{\kappa}^2 T + 2\lambda_c \lambda_{\kappa} T - 2hc\lambda_c = 0$$

$$\lambda_{R} > 0 \quad , \quad \text{mo}$$

$$\lambda_{\kappa} \approx 3,7 \cdot 10^{-12} = 3,7 \, \text{пм}$$