Answer on Question#50774 – Physics – Nuclear Physics

Question

The work function of substance is $4\ eV$. What is the longest wavelength of light that can cause the emission of photoelectrons from this substance?

Solution

$$A = \frac{hc}{\lambda} + K$$

, where A – work function, K – kinetic energy of photoelectron, h – Planck constant, c – speed of light, λ – wavelength.

If we are looking for the longest wavelength, we set $K = 0$, than:

$$A = \frac{hc}{\lambda}$$

$$\lambda = \frac{hc}{A}$$

$$h = 4.136 * 10^{-15} eV\ s$$

$$c = 3 * 10^8 \frac{m}{s}$$

$$\lambda = 4.136 * 10^{-15} * 3 * 10^8 * \frac{1}{4} = 3.102 * 10^{-7} m = 310.2\ nm$$