Answer on Question #50752, Physics, Nuclear Physics

When a metallic surface is illuminated with light of wave length (lambda),the stopping potential is X volt. When the same surface is illuminated of wave length 2lambda, stopping potential is X/3.

Threshold wave length for the metallic surface is....

Answer:

(https://en.wikipedia.org/wiki/Photoelectric_effect)

Will use photoelectric effect equation for this problem:

Energy of illumination photon $\frac{hc}{\lambda}$ equal to sum of work function φ and stopping opposite work eX.

1. $\frac{hc}{\lambda} = \varphi + eX$
2. $\frac{hc}{2\lambda} = \varphi + e\frac{X}{3}$

This system give us the result:

$$\frac{hc}{4\lambda} = \varphi$$

work function φ may be denote in mean of trash hold wavelength:

$$\varphi = \frac{hc}{\lambda_t}$$

It is obvious that:

$$\lambda_t = 4\lambda$$