

Quiz #3 Sol'n Phy 3305 Fall '09

A metal plate has 15 eV photons incident. Ten volts are required to stop the emitted electrons ejected from the plate. What is the work function of the plate?

$$\begin{aligned} h\nu - \phi &= \left(\frac{1}{2} m v^2\right)_{\text{max}} = e V_0 \\ \underbrace{E_\gamma}_{= 15 \text{ eV}} & \qquad \qquad \qquad \underbrace{\qquad \qquad \qquad}_{= (1e)(10V) = 10 \text{ eV}} \\ & \qquad \qquad \qquad \qquad \qquad \qquad \qquad \qquad \text{(max. K.E.)} \end{aligned}$$

$$\begin{aligned} 15 \text{ eV} - \phi &= 10 \text{ eV} \\ \boxed{\phi = 5 \text{ eV}} \end{aligned}$$