Answer on question #61814, Physics / Other

Question When a copper surface is illuminated by radiation of wavelength 2537 angstrome units the value of the stopping potential is found to be 0.24volts. Calculate the work function of copper.

Solution Work function can be found as

$$W = hc/\lambda - eE$$

where stopping potential is $E = -0.24$, electron charge is $e = 1.6 \cdot 10^{-19} C$ and wavelength $\lambda = 2537 \cdot 10^{-10} = 2.537 \cdot 10^{-7} m$. Hence

$$W = 6.6 \cdot 10^{-34} \cdot 3 \cdot 10^{8} / (2.537 \cdot 10^{-7}) - 1.6 \cdot 10^{-19} \cdot 0.24 \approx 7.416 \cdot 10^{-19}\, J \approx 4.6\, eV$$