Answer on Question #58591, Physics / Quantum Mechanics

Find work function for a silver surface for which the threshold frequency of incident light is 1.1×10^{15} Hz.

Find: A – ?

Given:

$\upsilon_{min}=1,1 \times 10^{15}$ Hz

$h=6,626 \times 10^{-34}$ J×s

Solution:

Equation of external photoelectric effect:

$$h\upsilon = A + \frac{mv_{max}^2}{2} \text{ (1)},$$

where $h\upsilon$ – energy of photon,

A – electron work function of the metal surface,

$\frac{mv_{max}^2}{2}$ – the maximum kinetic energy of the electron

Of (1) $\Rightarrow h\upsilon_{min} = A$ (2)

Of (2) $\Rightarrow$ A=7,29×10^{-19} J

1 eV – 1,6×10^{-19} J

A   – 7,29×10^{-19} J

A=4,56 eV

Answer:

4,56 eV