Answer on Question #43955, Physics, Atomic Physics

Calculate the velocity of electron ejected from a platinum surface when radiation of $\lambda = 200$ nw falls on it . The work function of platinum is $A = 5$ eV $= 8 \cdot 10^{-19}$ J(1ev = 1.6*10-19 J).

Solution

Velocity can be found from energy conservation law

$$hc/\lambda = A + mv^2/2$$

$$v = \sqrt{2(hc/\lambda - A)/m} = \sqrt{2(6.3 \cdot 10^{-34} \cdot 3 \cdot 10^8/(200 \cdot 10^{-9}) - 8 \cdot 10^{-19})/(9.1 \cdot 10^{-31})}$$

$$\approx 0.4 \cdot 10^6\, m/s$$