PH-105 Assignment Sheet - 2 (Quantum Mechanics)

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1. **Light of wavelength 2000 Åfalls on a metal surface. If the work function of the metal is 4.2 eV, find the kinetic energy of the fastest and the slowest emitted photoelectrons. Also find the slopping potential and cutoff wavelength for the metal.**
Solution :
Lets find the energy of photon
$E = hc/\lambda$
$E = 12400/2000ev = 6.2ev$
Now the energy of emmited electrons is ranged from 0 to E_{Max}.
Here $E_{Max} = E_p - W$
So $E_{Max} = 6.2 - 4.2 = 2ev$
So stopping potential is $V = E/C = 2V$
For cutoff wavelength $E_p = W = 4.2ev$
So $\lambda = hc/E = 12400/4.2 = 10333$Å.