PH 105 – Quantum Mechanics

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23.09.12

3)

$hc/\lambda - \phi = eV$

$hc(1/\lambda_1 - 1/\lambda_2) = e(V_1 - V_2)$

$h = e(V_1 - V_2)/ [c(1/\lambda_1 - 1/\lambda_2)]$

Substitute

$\lambda_1 = 1850Å$ $\lambda_2 = 5460Å$ $V_1 = 4.62\ V$ $V_2 = .18\ V$

On solving,

$h = 6.64 \times 10^{-34}$

Substitute this value in $hc/\lambda_1 - \phi = eV_1$

$\Phi = 3.366 \times 10^{-19}$ J

$\Phi = 3.366 \times 10^{-19} / 1.602 * 10^{-19} = 2.1$ eV

$h\nu_t = 3.366 \times 10^{-19}$

$\nu_t = 3.366 \times 10^{-19} / 6.64 \times 10^{-34}$

$\nu_t = 0.5 \times 10^{-15}$ Hz