FORMULAE

PHOTOELECTRIC EFFECT

$W_0 = h\nu_0 = \frac{hc}{\lambda_0}$. $W_0 \rightarrow$ Work function, Minimum Energy for Electron emission.

$\nu_0 \rightarrow$ Threshold frequency for electron emission.

$\lambda_0 \rightarrow$ Maximum Wavelength for electron emission.

If $\nu > \nu_0$, $\quad E_{K\,max} = h\nu - h\nu_0$

$E_{K\,max} = \frac{1}{2} m_e v^2 \rightarrow$ the MAXIMUM (kinetic) energy of electrons.

$\Rightarrow h\nu = W_0 + \frac{1}{2} m_e v^2 \longrightarrow$ Einstein's Photoelectric Equation.

$\frac{1}{2} m_e v^2 = e\phi_s$, $\phi_s \rightarrow$ Stopping (extinction) potential

When current stops, $e\phi_s = h\nu - W_0$

ATOMIC PHYSICS

$\frac{1}{\lambda} = R\left(\frac{1}{K^2} - \frac{1}{n^2}\right) \longrightarrow$ Rydberg formula for spectral series

$R = 1.097 \times 10^7 \ m^{-1}$ (Rydberg constant).

$K=1$ (Ultraviolet: Lyman), $K=2$ (Visible: Balmer),

$K \geq 3$ (Infrared: Paschen, Brackett, Pfund).

$E_n = -\frac{Z^2}{n^2} |E_1| \longrightarrow$ Bohr Quantisation of Energy Levels.

$|E_1| = \frac{4\pi^2 m_e e^4}{2(4\pi\epsilon_0)^2 h^2} = 13.6 \ eV$, $Z = 1$ for the hydrogen atom

$n \longrightarrow$ Principal Quantum Number, Quantises Energy

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