Physics Formula Sheet

Chapter by chapter, topic by topic. Written by the PadhoNa team for quick revision.

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CHAPTER 29

Atomic Physics

Bohr's model and hydrogen spectrum

QUANTISATION

$$mvr = \frac{nh}{2\pi}$$

RADIUS, SPEED, ENERGY

$$r_n = 0.529\frac{n^2}{Z}\ \text{Å}, \qquad v_n = 2.18\times10^6\frac{Z}{n}\ \text{m/s}, \qquad E_n = -13.6\frac{Z^2}{n^2}\ \text{eV}$$

SPECTRAL LINES

$$\frac{1}{\lambda} = RZ^2\left(\frac{1}{n_1^2} - \frac{1}{n_2^2}\right)$$

Lyman $n_1 = 1$ (UV), Balmer $n_1 = 2$ (visible), Paschen $n_1 = 3$ (IR).

NUMBER OF LINES

$$\frac{n(n-1)}{2}\ \text{(from level } n \text{ down to the ground state)}$$

$$K = -E, \qquad U = 2E$$

X-rays

CUT-OFF WAVELENGTH

$$\lambda_{\min} = \frac{hc}{eV}$$

MOSELEY'S LAW

$$\sqrt{\nu} = a(Z-b)$$

Not in the current JEE Main syllabus; kept for older papers.

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