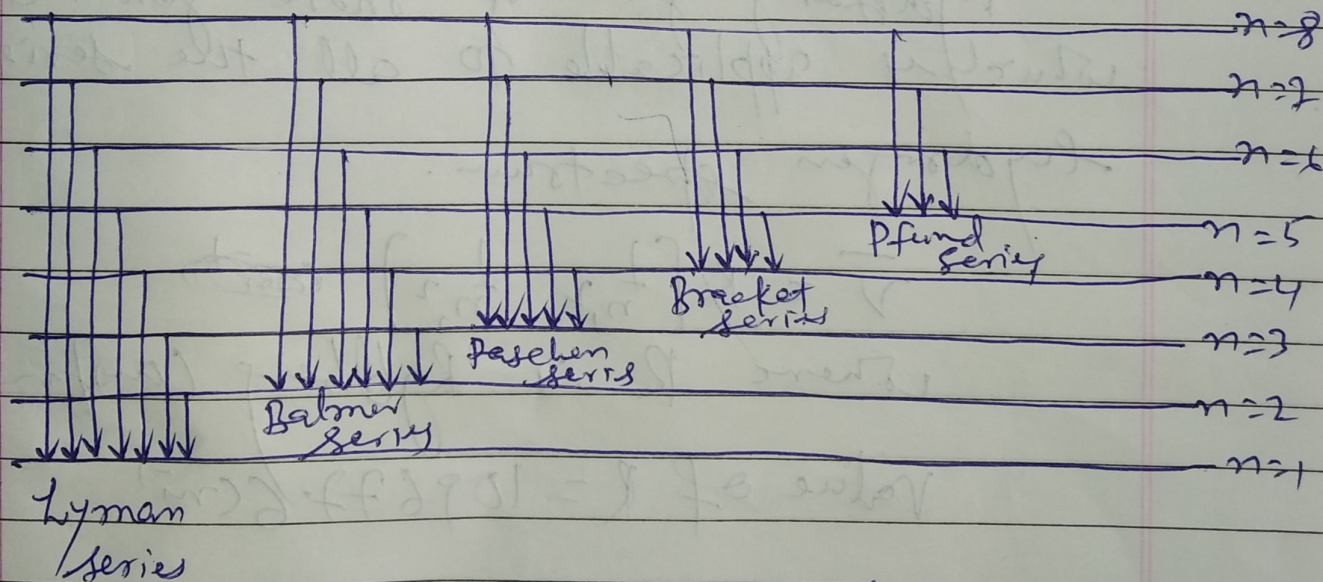


Atomic structure

Topic: Hydrogen Spectra and Bohr interpretation.

When an electric discharge is passed through gases, light is emitted. Analysis of the light emitted through a prism shows the existence of sharp lines of definite wavelengths. For the simplest atom, hydrogen, the spectrum consist of a no. of lines.



All these five spectral line series are observed when they jump from higher orbit to lower orbit.

Bohr calculated frequencies and wavelengths of various lines in ~~higher orbit having~~ the atomic spectrum of hydrogen.

The line of emission spectrum of hydrogen are classified into five series as follows: —

- (i) Lyman series — Ultraviolet region
- (ii) Balmer series — Visible region
- (iii) Paschen series — Infra red region
- (iv) Brackett series — Infra red region
- (v) Pfund series — Infra red region.

Rydberg gave a more general formula which is applicable to all the series in hydrogen spectrum.

$$\bar{\nu} = R \left[\frac{1}{n_1^2} - \frac{1}{n_2^2} \right]$$

where R is Rydberg constant
 value of $R = 109677.6 \text{ cm}^{-1}$

where n_1 & n_2 is an integer which is shell no., such that $n_2 > n_1$