

Hydrogen Spectrum  $\Rightarrow$  The hydrogen spectrum is a series of discrete spectral lines emitted when excited hydrogen electrons drop to lower energy levels, releasing quantized energy photons. It consists of several series based on final electron orbits.



(1) Lyman Series  $\Rightarrow$  It exists in the ultra-violet region

$$\frac{1}{\lambda} = R \left( \frac{1}{1^2} - \frac{1}{n_i^2} \right)$$

where  $n_i = 2, 3, \dots$

$R \rightarrow$  Rydberg Constant

(2) Balmer Series  $\Rightarrow$  It exists in the visible region

$$\frac{1}{\lambda} = R \left( \frac{1}{2^2} - \frac{1}{n_i^2} \right)$$

where  $n_i = 3, 4, \dots$

(3) Paschen Series  $\Rightarrow$  It exists in the infrared region (near zone)

$$\frac{1}{\lambda} = R \left( \frac{1}{3^2} - \frac{1}{n_i^2} \right)$$

where  $n_i = 4, 5, \dots$

④ MJC-8. (46)  
 Brackett series  $\Rightarrow$  It exist in I.R region (mid-zone)

$$\frac{1}{\lambda} = R \left( \frac{1}{4^2} - \frac{1}{n_i^2} \right)$$

where  $n_i = 5, 6, 7, \dots$

⑤ Pfund series  $\Rightarrow$  It exist I.R region (far zone)

$$\frac{1}{\lambda} = R \left( \frac{1}{5^2} - \frac{1}{n_i^2} \right)$$

where  $n_i = 6, 7, 8, \dots$

