* Ionization Energy :-

→ energy required to sending $e^{\ominus}$ to infinity.

$\Delta E = I.E = +13.6 Z^2 eV$

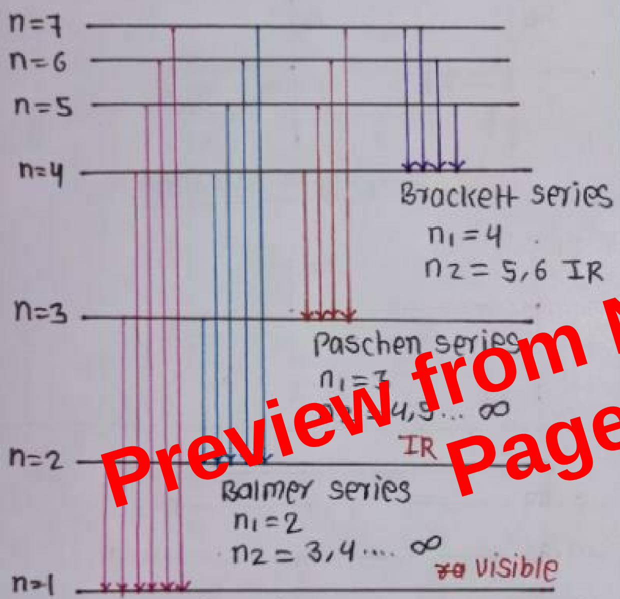
$\Delta E = I.E = +13.6 Z^2 \times 96$ KJ/mol

* Binding energy :-

→ Energy required to ~~some $e^{\ominus}$~~ remove $e^{\ominus}$ from given energy shell.

$BE = |\text{energy of } n\text{th shell}| = \frac{13.6 Z^2}{n^2} eV$

* Hydrogen Spectrum *



Lymen series

$n_1 = 1$

$n_2 = 2, 3 \dots$

UV.

* Rydberg's Formula *

$$\boxed{\bar{v} = \frac{1}{\lambda} = RZ^2 \left[\frac{1}{n_1^2} - \frac{1}{n_2^2} \right]}$$

$R = 109677\ cm^{-1} = 1.0967 \times 10^5 = 10^5\ cm^{-1}$

* Lyman Series → (α or $H\alpha$ line),

$\boxed{\lambda_a = \frac{4}{3RZ^2}}$ — First line of Lyman

→ Second line (β or H_β line)

$\boxed{\lambda_B = \frac{9}{8RZ^2}}$

→ Line of Shortest wavelength

$\boxed{\lambda_{min} = \frac{1}{RZ^2}}$

→ Line of longest wavelength

$\boxed{\lambda_\alpha = \frac{4}{3RZ^2}}$

• calculation of no. of spectral line:

$\boxed{\frac{(n_2 - n_1)(n_2 - n_1 + 1)}{2}}$

$\boxed{n_2 - n_1}$ → single $e^{\ominus}$

[not ground] State of that series

↓

Specific series.

Drawback of Bohr's model

→ Applicable for single $e^{\ominus}$ species

→ not explain stark effect & zeaman effect.

• De - Broglie concept :-

$\lambda \propto \frac{1}{P}$

$\lambda \propto \frac{h}{P} = \frac{h}{mv} = \frac{h}{\sqrt{2m(K.E)}}$

$\lambda e = \sqrt{\frac{150}{V}}\ \mathring{A}$ or $\frac{12.21}{\sqrt{V}}\ \mathring{A}$

↓

Particle accelerated from rest.