radius

$$r = \frac{n^2h^2}{4\pi^2 mkze^2}$$

$$r = 0.529 \times \frac{n^2}{Z} \times 10^{-10}$$

$$= a_0 \frac{n^2}{Z}$$

radius ratios

$$\frac{r_1}{r_2} = \frac{n_1^2 \times Z_2}{n_2^2 \times Z_1}$$

$$\Delta r = \frac{a_0}{Z}(n_2^2 - n_1^2)$$

Time

$$T = \frac{n^3h^3}{4\pi^2 mk^2 z^2 e^4}$$

$$\therefore T = T_0 \frac{n^3}{Z^2}$$

where $T_0 = 1.52 \times 10^{-16}$ sec

Frequency.

$$\nu = \frac{4\pi^2 mk^2 z^2 e^4}{n^3h^3}$$

Coloumbic force of attraction

~~C.F of A = $\frac{kze^2}{r^2}$~~

Centrepetal force $= \frac{kze^2}{r^2}$.

$$C.F \text{ of } A = \frac{16\pi^4 m^2 k^3 z^3 e^6}{n^4 h^4}.$$

$$C.F \propto \frac{z^3}{n^4}.$$

velocity

$$V = \frac{2\pi kze^2}{nh}$$

$$V = 2.18 \times 10^6 \frac{Z}{n} \text{ m/s}$$

$$= V_0 \frac{Z}{n}$$

Ratio

$$\frac{V_1}{V_2} = \frac{n_2 \times Z_1}{n_1 \times Z_2}$$

~~Charg~~ Current =

$$\text{Current} = \frac{\text{Charge}}{\text{time}}$$

$$= \frac{e \times 4\pi^2 mk^2 z^2 e^4}{n^3h^3}$$

$$= \frac{4\pi^2 mk^2 z^2 e^5}{n^3h^3}$$

$$= e \times \nu \text{ (Freq).}$$

K.E

$$K.E = \frac{2\pi^2 m k^2 z^2 e^4}{n^2h^2}$$

$$E_0 = 2.18 \times 10^{-18} J$$

$$\therefore K.E = E_0 \frac{z^2}{n^2}$$

P.E =

$$= -\frac{4\pi^2 m k^2 z^2 e^4}{n^2h^2}$$

$$= -4.36 \times 10^{-18} \frac{z^2}{n^2} J$$

$$r = \frac{n^2 h^2}{4\pi^2 mkZe^2}$$

$$r = a_0 \frac{n^2}{Z}$$

where $a_0 = 0.529$ A°.

$$V = \frac{2\pi kZe^2}{nh}$$

$$= \underline{2.18 \times 10^6} \frac{Z}{n} \text{ m/s}$$

$$V = \underline{V_0} \frac{Z}{n}$$

$$T = \frac{n^3 h^3}{4\pi^2 mk^2 Z^2 e^4}$$

$$= T_0 \frac{n^3}{Z^2}$$

where $T_0 = 1.52 \times 10^{-16}$

$$\nu_{(Freq)} \frac{4\pi^2 mk^2 Z^2 e^4}{n^3 h^3}$$

$$\text{Current} = \frac{4\pi^2 mk^2 Z^2 e^5}{n^3 h^3}$$

$$= e \times \nu$$

$$\text{Coloumbic Force} = \frac{16\pi^4 m^2 k^3 Z^3 e^6}{n^4 h^4}$$

$$K.E = E_0 \frac{Z^2}{n^2} \text{ J}$$

where $E_0 = 2.18 \times 10^{-18}$ J

$$= \frac{2\pi^2 m^2 k^2 Z^2 e^4}{n^2 h^2}$$

$$P.E = \frac{-4\pi^2 mk^2 Z^2 e^4}{n^2 h^2}$$

$$P.E = -4.36 \times 10^{-18} \frac{Z^2}{n^2} \text{ J}$$

$$P.E = -27.2 \frac{Z^2}{n^2} \text{ eV}$$

$$T.E = \frac{-2.18 \times 10^{-18}}{} \frac{Z^2}{n^2} \Big/ -13.6 \frac{Z^2}{n^2} \text{ eV}$$

$$T.E = E_0 \frac{Z^2}{n^2}$$

$$B.E/S.E = 13.6 \frac{Z^2}{n_1^2}$$

$$T.E\ (\Delta E) = 2.18 \times 10^{-18} / 13.6\, Z^2 \left(\frac{1}{n_1^2} - \frac{1}{n_2^2}\right)$$

Reydberg Constant

$= 1.09 \times 10^7$ m^{-1}

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

$$\frac{1}{R_H} = 912 \text{ A°}$$

i] For Principal Q.N,
Angular Momentum = $\frac{nh}{2\pi}$
Represents = ~~Ai~~ Size.
Max $e^\ominus$ = $2n^2$,
No of Orbital = n^2
It was discovered by bohr.

ii] Azimuthal Q.N,
$l \rightarrow$ subshell
No. of orbitals in a subshell = $2l+1$
Max no of $e^\ominus$ in subshell = $4l+2$.
orbital angular momentum = $\sqrt{l(l+1)}\frac{h}{2\pi}$
Represent = Shape

iii] Magnetic Q.N.
Discovered by Zeeman
total values for a subshell = $2l+1$.
Values are from $-l$ to l including '0'.
each value of $M \rightarrow$ Orbital.
Represents $\rightarrow$ Orientation

iv] Spin Q.n,
Two values $\rightarrow +\frac{1}{2}$ and $-\frac{1}{2}$
Overall spin = Σs
Spine multiplicity = $2s+1$
~~spin~~ angular momentum = $\sqrt{s(s+1)}\frac{h}{2\pi}$

Magnetic Moment
$M = \sqrt{n(n+2)}$

Radial node = $R_0 = n-l-1$

Angular node = $A_0 = l$.

4 Methods of Identifying Position of element.

i] $ns^1/ns^2 \rightarrow$
n = Period no
$1/2$ = group no.

ii] $(n-1)d^x\ ns^2$
block = d block
Period = n
group = $2+x$.

iii] $(n-2)f^x\ (n-1)d^{0-1}\ ns^2$
Block = F
Period = n
group = ~~2+~~ 3.

iv] $ns^2\ np^z$
group = $2+z+10$
period = n.
plock = p.