

Date - 3-11-25 Name of Teacher: Assistant Professor
Dr. Anant Kumar S.B. College Ara.

Class - U.G sem-I (Session 25 to 28) M.Tc Theory.

Subject: $\rightarrow$ Inorganic Chemistry.

Topic Name: $\rightarrow$ Chemical Bonding and molecular structure.

Valency: Cl, O, H and give HCl, H₂O, NH₃ and CH₄ due to chemical union with H. It is observed that HCl combines with only one H, but combines with 4H. Thus different elements have different capacity to combine with an element.

The capacity of an element to combine with another element is called valency.

Critical potential: $\rightarrow$ energy required to transfer an electron from lower level to next higher level is called critical potential.

Critical potential is of two types: $\rightarrow$

(i) Ionization potential (ii) Resonance potential

$$\Delta E = E_2 - E_1 = \frac{2\pi^2 m^2 e^4}{h^2} \left(\frac{1}{n_1^2} - \frac{1}{n_2^2} \right)$$

In case I.P., $n_2 = \infty$ and $S_0 =$

$$\Delta E = \text{I.P.} = \frac{2\pi^2 m^2 e^4}{n_1^2 h^2}$$

For H, $Z=1$, $n_1=1$ and I.P. $\frac{2\pi^2 m^2 e^4}{h^2}$

Critical potential (Resonance) $\frac{h^2}{8\pi^2 m} = 13.6 \text{ eV}$

$$\Delta E = \frac{2\pi^2 m e^4}{h^2} \left[\frac{1}{(1)^2} - \frac{1}{(2)^2} \right]$$

$$= 13.6 \times \frac{3}{4} = 10.2 \text{ eV}$$

To be continued.