Charge and mass of subatomic particle

$M_{e^-} = 9.11 \times 10^{-31} kg$

$q_{e^-} = -1.602 \times 10^{-19} C$

Mass of 1 mol e^- $= N_A \times M_{e^-}$

Charge (Q) of 1 mol e^- $= N_A \times q_{e^-}$

No. of protons in (1 mole) a molecule (like NH_3) $= (\text{at. no. of N} + 3 \times \text{atomic no. of H}) N_A$

mass of protons $= 1.672 \times 10^{-27} kg$

Atomic No & Atomic Mass

$^{56}_{26}Fe$ → Atomic mass = no. of protons + no. of neutrons

↳ Atomic no. ⇒ no. of protons = ~~no. of neutrons~~

= no. of electrons

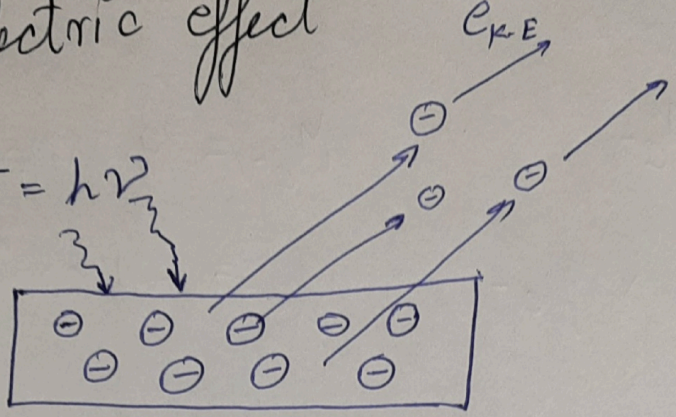
Wavelength - Wave number - Frequency - Time period - Energy

$$E = h\nu = \frac{hc}{\lambda} = hc\bar{\nu} = \frac{h}{T}$$

T → period of wave

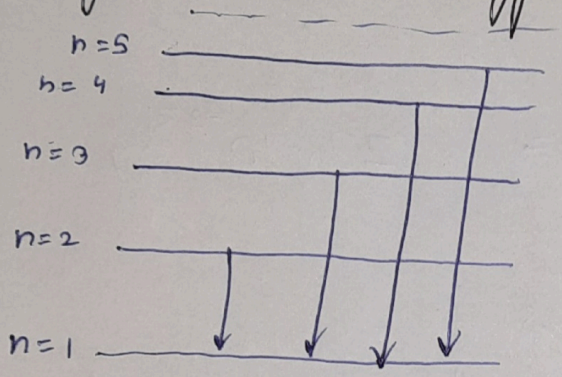
$$\nu = \frac{c}{\lambda} = c\bar{\nu} = \frac{1}{T}$$

Photoelectric effect



Work funct^{n} $\rightarrow \phi_0 = h\nu_0$

Hydrogen Atom energy levels



$$E_n = -2.18 \times 10^{-18} \left(\frac{Z^2}{n^2}\right) J$$

Hydrogen like systems → Like He^{+}, Li^{+2}, etc
where there is only 1 valance e^{-}

Debroglie's Hypothesis

$$\lambda = \frac{h}{p} = \frac{h}{mv}$$

Quantum numbers

Principal quantum no. → $n = 1, 2, 3 \cdots$

Azimuthal quantum ~~no~~ no. → $l = 0, 1, 2, \cdots n-1$

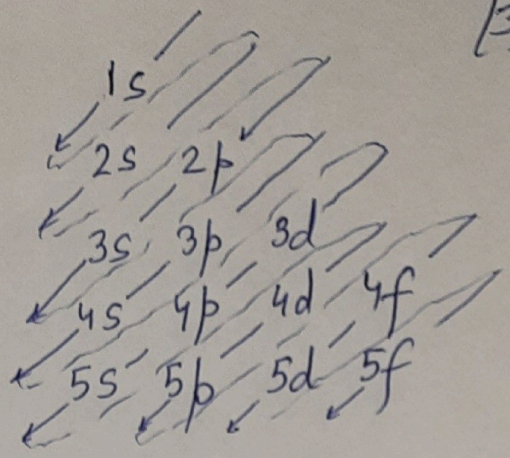
magnetic quantum no. ⇒ $m_l = -l, -l+1, \cdots, l-1, l$

Spin quantum no. ⇒ $m_s = \pm 1/2$

Electronic Configuration

Increasing order of $n+l$:-

1s, 2s, 2p, 3s, 3p, 4s, 3d, 4p, 5s



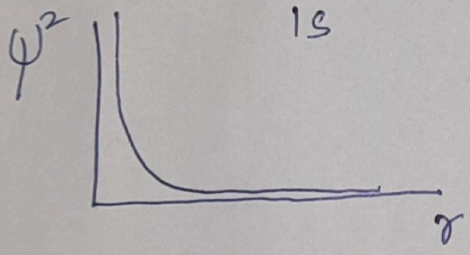
Nodes in orbitals

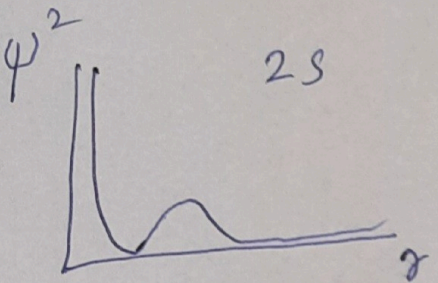
no. of radial nodes = $n-l-1$

no. of angular nodes = l

no. of nodes = $n-1$

Effective nuclear charge





* The extent to which the e^- will experience a nuclear charge is known as effective nuclear charge.