

$$n^* = n - \delta \quad \delta \text{ is the quantum defect}$$

Drawbacks in Sommerfeld's model

- (i) Components of the fine structure
- (ii) Relative Intensity
- (iii) Azimuthal quantum number
 k is different from l (obtained from wave mechanics)
- (iv) Uncertainty principle
- (v) Involvement of both classical and quantum mechanics
- (vi) Polyelectronic system.

orbital momentum vector $\vec{l} = l \left(\frac{h}{2\pi} \right)$

wave mechanically $\vec{l} = \sqrt{l(l+1)} \frac{h}{2\pi}$

total angular quantum number

$$\vec{j} = \vec{l} + \vec{s} \quad j = J \left(\frac{h}{2\pi} \right)$$

wave mechanically $j = \sqrt{J(J+1)} \left(\frac{h}{2\pi} \right)$

j is called inner quantum number or mechanical moment quantum number