A substance, if attracted into a magnetic field with a force potential to the field strength times field gradiant, is called paramagnetic and the phenomenon, paramagnetism. Paramagnetism is generally caused by the presence in the substance of atoms, ions or molecules which have unpaired $e^{\ominus}$. Each of these unpaired $e^{\ominus}$ has a definite paramagnetic moment which exists in the absence of any external magnetic field.

$e^{\ominus}$ determines the magnetic properties of matter in two ways. The $e^{\ominus}$ may be regarded as a small sphere of negative charge spining on its own axis. This spinning of charge produces a magnetic moment and is called spin magnetic moment (μ_s). Secondly, the orbital motion of $e^{\ominus}$ in a closed path around the nucleus will also produce a magnetic moment, called orbital magnetic moment (μ_l).

The equation of spin and orbital magnetic moments are as follows.

$$\mu_s = g\sqrt{S(S+1)}\,\beta$$

$$\mu_l = g\sqrt{l(l+1)}\,\beta$$

Where μ_s and μ_l are spin and orbital magnetic moments respectively, g is the gyro-magnetic factor having values 2 & 1 for μ_s and μ_l respectively. S and l are spin and angular

momentum quantum no. for individual unpaired $e^{\ominus}$ and β = Bohr Magneton (BM) = $\frac{eh}{4\pi mc}$

The μ_s values generally approximately 1000 times greater than μ_l and are of greater importance in determining paramagnetic properties of a substance.

For a system containing single unpaired $e^{\ominus}$, $s = \frac{1}{2}$ and $\mu_s = 2\sqrt{\frac{1}{2}\left(\frac{1}{2}+1\right)} = 1.73$ BM