$\frac{1}{2}MV^2 = eV$

$MV^2 = 2eV$

$r^2 = \left[\frac{2eV}{m}\right]$

$v = \left[\frac{2eV}{m}\right]^{1/2}$

v - velocity of the particle

M = Mass of the particle.

e = charge of the electron.

$HeV = \frac{Mv^2}{r}$ $\quad r = \frac{MV}{eH}$ $\quad$ (1) $\quad \boxed{m/e = \frac{H^2 r^2}{2V}}$

TYPES OF PEAKS(5Marks)

- Molecular ion peak
- Metastable peak
- Base peak
- Isotopic peak

MOLECULAR ION PEAK: (5 Marks)

Definition:

The electron bombardment with energy 10-15 eV usually removes one electron from the molecule of the organic compound in the vapour phase.

It results in the formation of molecular ion.

Explanation:

- The higest occupied orbital of aromatic system and non bonding electrons orbitals on oxygen,nitrogen atoms readily lose one electron.
- Unsaturated compounds give more intense peak as compared to saturated .

Molecular ion peak formed in examples:

- Bromo compounds m+ and (M+2)peaks are indensity ratio1:1
- Chloro compounds m+ and (M+2)peaksare intensity ratio1:1

META STABLE PEAK: (5 Marks)

Definition:

The life time of an ion may be so small that it undergoes decomposition during its passage between the source and collector units in the mass spectrometer. The ions resulting from the decomposition between the source region and the magnetic analyzer are called meta stable ions. The corresponding peaks are called meta stable peak.

Explanation:

The meta stable ions appear in the spectrum as broad peaks at non integral mass numbers. These peaks are weaker in intensity that is useful in studying the mechanism of fragmentation. The formation of the meta stable ion can be written as,

$$M_1^+ \rightarrow M_2^+ + M_o$$

Here,

M_1^+ - Molecular ion

M_2^+ - Daughter ion

M_o - Neutral fragment