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1. The mass spectrometer experiment applies both the Knowledge of electric and magnetic field to determine the mass of an atom. First of all, a gas of atoms is ionized by firing a beam of particles at the gas which either adds electrons to the atoms in it or Knocks a few of their electrons off depending on the type of particle beam used. This gives the atoms now known as "ions" a net negative or positive electric charge. Next the ions are sent through a tube in which they are subjected to electric and magnetic fields. Both of the fields exert on force of the ions, and the strengths of the two force are proportional to the ions change. The electric force causes the ions to change speed, while the magnetic fields bend their path. Magnetic force is always perpendicular to velocity, so that it does no work on the changed particle. Here, the magnetic force supplies the centripetal force.

$F_c = \frac{mv^2}{r}$, nothing that $\sin\theta = 1$, we see that

$F = EVB$ because the magnetic force F supplies the centripetal force we have $\left[EVB = \frac{mv^2}{r} \right]$

Solving for yields

$$\left[r = \frac{mv}{E^3} \right]$$

By way of Newtons Second Law of motion, $F = ma$, $m = F/a$, dividing the total force acting on the ions by their resulting acceleration to determine the ions mass.

2. Electric field is defined as the electric force per unit charge or a region around a charged particle or object to which a force would be exerted.

$\bar{E} = \frac{F}{q}$, The direction of the field is taken to the direction of the force it would exert on a positive charge.

Magnetic Field is a vector field that describes the magnetic flux on moving electric charges, electric currents and magnetize materials.

Electric current is a stream of charge particles such as electrons or ions moving through an electrical conductor or space. It is measured at the net ratio of flow electric charge put a region.

$I = \frac{V}{R}$, $I = \frac{Q}{t}$.