

Mass Spectrometer

For a molecule, the highest peak represents the molecular (parent) ion and its mass gives the relative molecular mass, M_r of the compound (and the fragmentation pattern can help determine its structure).

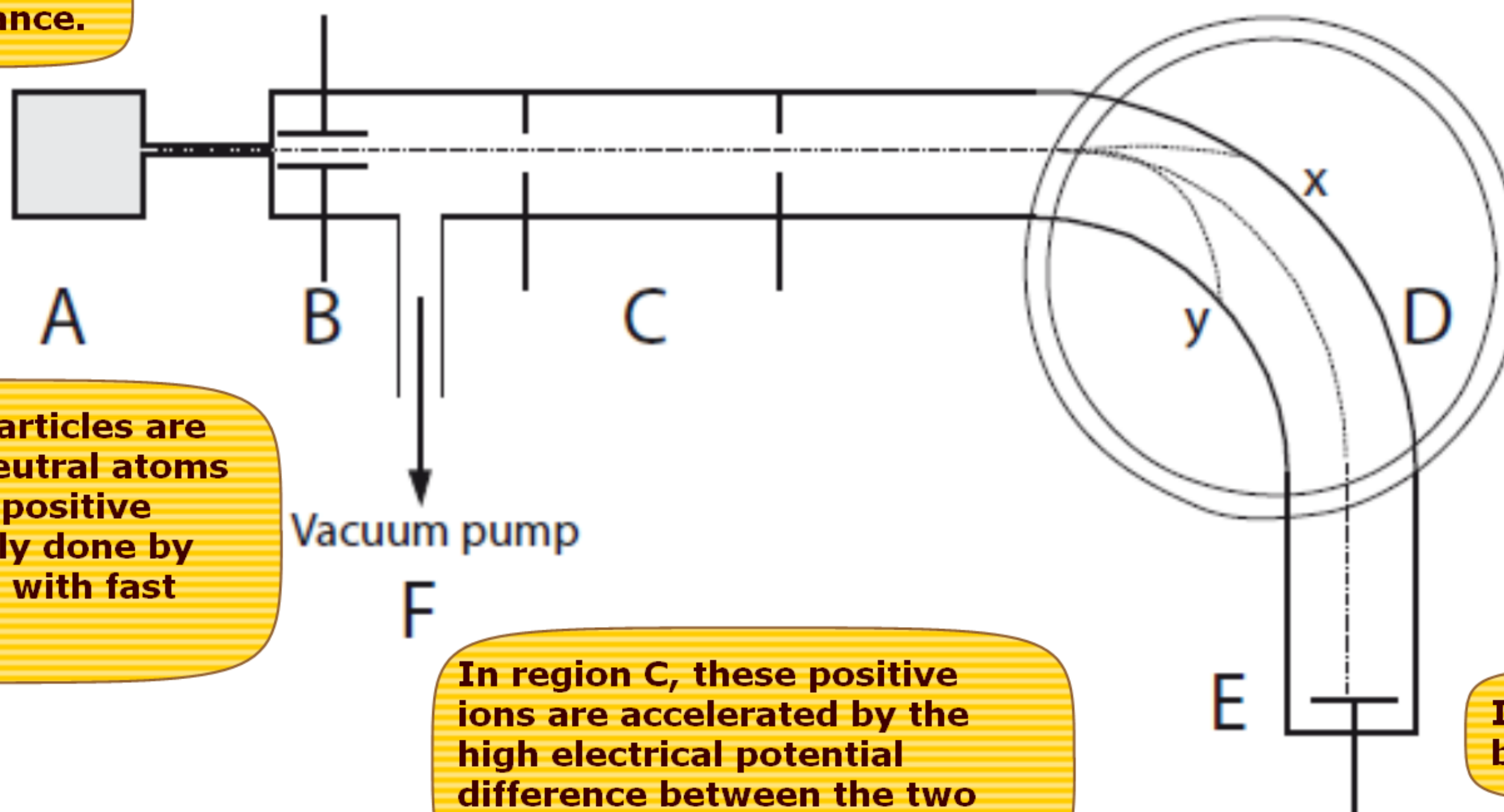
Stages of Operation:
Vaporization of sample
ionization to produce M^+ ions
acceleration of ions by electric field, deflection of ions by magnetic field, vacuum, detection of ions.

Degree of deflection:

- Lower the mass, higher the deflection.
- Higher the charge, higher the deflection.
- Deflection reflects mass/charge ratio; for charge of +1, deflection depends on mass.

For an element, the mass spectrum gives two important pieces of information: the number of isotopes, and the abundance of each isotope; thus the relative average atomic mass, A_r can be calculated.

Region A contains the vapourised substance.



In region B, the particles are converted from neutral atoms or molecules into positive ions. This is usually done by bombarding them with fast moving electrons

In region D these fast moving ions enter a magnetic field. This causes the fast moving ions to deflect

In region C, these positive ions are accelerated by the high electrical potential difference between the two parallel electrodes

In region E particle will be detected