Mass Spectroscopy

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1 Introduction

The purpose of spectrometry and spectroscopy is to provide clues about the structure of the molecule. It is a technique that is very useful in isotopic analysis of specific elements in small samples. We have to see what types of clue we can get from the Mass Spectrometry. In Mass spectrometry we start with the original molecule and we can call the original molecule capital M. M would stand for the original molecule, and then we hit that with a high energy electron.

$$M + 1r$$

Where 1r would be the high energy electron. And what the high energy electron does is highly speaking, it is ritiate of the the molecule and hits another molecule.

$$M + 1r- > M + Ze$$

And now when one of its molecule had one of its electrons lose,it is a radical molecule

$$M + 1r- > M(positive) + Ze$$

A radical molecule is drawn with and ampere electron. And it has a positive charge since it has lost an electron.This is a radical cation. M is called the moderation parent ion. The operate is uses a magnetic field to detect the properties of what is going to the operate when we use a magnetic field. In physics the magnetic force only effects charged particles. Formula for magnetic force:

$$Fb = qubetasin(t)$$

It only effects particle with a charge. That is the whole point to make the M a capital M, so it will be effected by the magnetic field. Now what the operate can do, it can use adjustments of the magnetic fiel to determined the:

$$\frac{M}{Z}$$

Ratio. Where M stands for Mass and Z stands for charge. By adjust the magnetic field we can determined what the M over Z ratio is for the particle

that goes through the operates. Z is the 1 for the molecular ion, because it got only one positive charge, so the M over Z is just going to tell us the mass

$$\frac{M}{Z} = Mass$$

And it turns out that almost all particles in fragments that we are going to run through the operates are all gonna have charges of 1. So even technically speaking the operates tells us M over Z, in practically speaking it tells us the Mass.

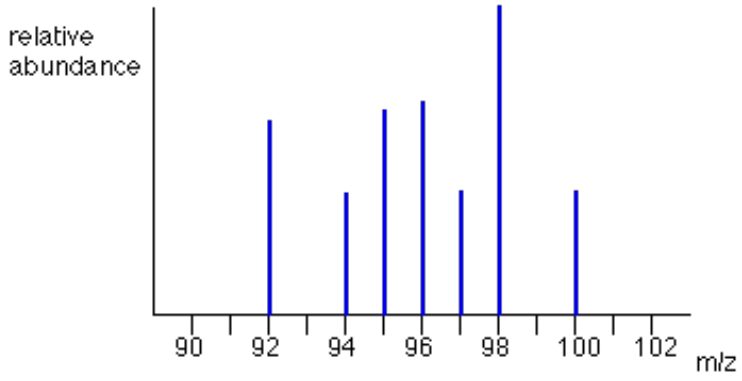

Figure 1: M over Z

The horizontal axes tells us the mass of the particle that are detected. And the vertical axes measure of Bondon's how many of the particles are making it to the detector. The molecular ion will give us a peak like the blue lines, that shows how many of the molecular ions are getting to the detecter, and than we can do at the horizontal axes to see what the total mass is. For instance: The original molecule was methionine:

$$CHy$$

Than the molecular ion is the radical cation of methionine.

$$M(positive) = (CHy)$$

And than M over Z would be:

$$12 + 4 = 16$$

And you would get a mass of 16.