Mass Spectroscopy
Essays
Physics class section 11

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1 Introduction

1.1 Definitions

Due to my research on the categories of Mass Spectroscopy, it is an analytical chemistry technique that benefit people to identify different characteristics and amount of different molecules. It is measuring the mass-to-charge ratio and abundance of gas-phase ions.

1.2 Outline of what happened in the mass spectroscopy

There are four section in the Mass spectroscopy can be seperated to explain, which is: Ionisation, Accelerations, Deflection, Detection. These four parts had to work together in order for the mass spectroscopy to function and collect datas.

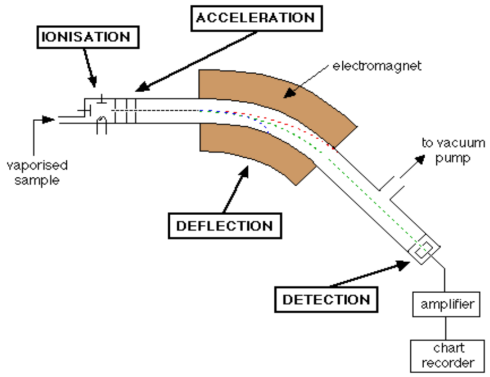

Figure 1: label image

2 calculations

2.1 formulae in accelerator

$$r = \frac{mv^2}{qvb} = \frac{mv}{qb}$$

If the velocity v is produced by an accelerating voltage V:

$$k(gain) = U(loss)$$

$$\frac{1}{2}mv^2 = qv$$

$$v = \sqrt{\frac{2qv}{m}}$$

After substitutions:

$$r = \frac{1}{B}\sqrt{\frac{2mv}{q}}$$

2.2 Velocity selector with B,E

$$F(B) = F(E)$$

$$qvb \times sin(90) = qE$$

$$vb \times 1 = E$$

$$V = \frac{E}{B}$$

2.3 Radius of path produce by magnetic field

$$F(net) = ma$$

$$qvb \times sin(90) = m \times \frac{v^2}{r}$$

$$qB = m \times \frac{v}{r}$$

$$\frac{q}{m} = \frac{v}{rB}$$

3 Stick diagram

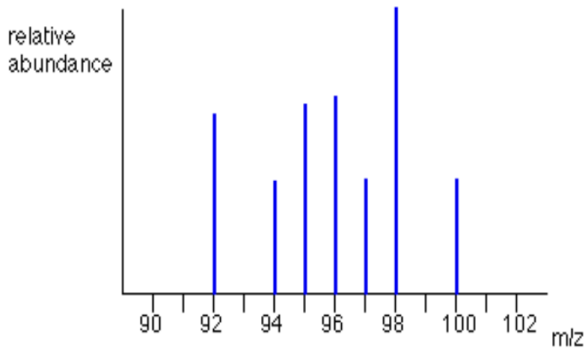

Figure 2: label image

The image above is a diagram of the mass spectroscopy result, the chart recorder mark down all the data. The data is often managed and organized as a stick diagram. This shows the relative current produced by ions of varying mass/charge ratio.