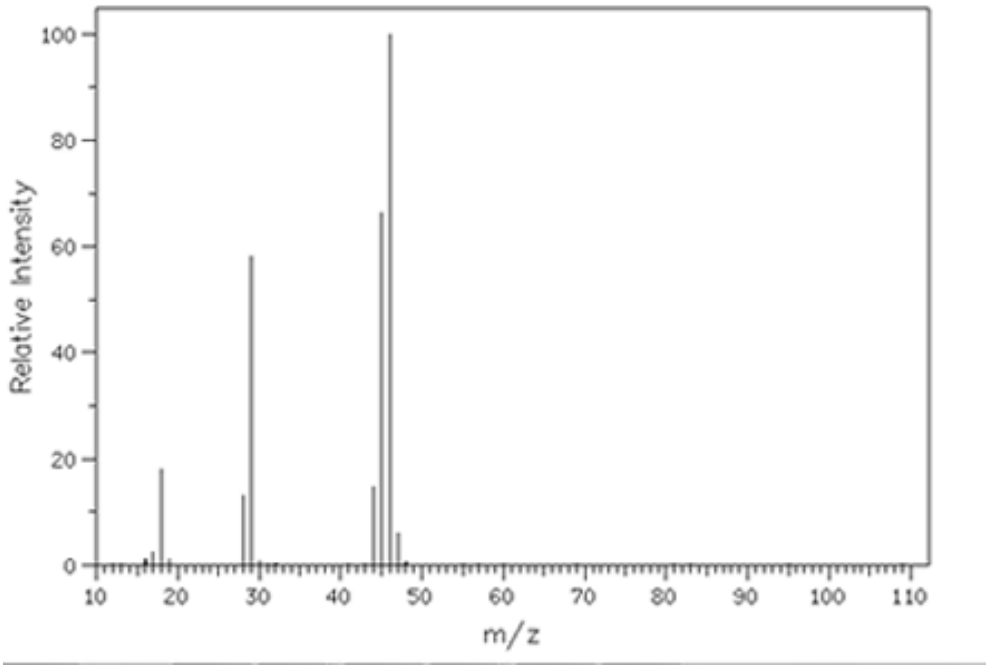
Friday Worksheet **Name: …….**
Mass spectroscopy 2

1) Consider the mass spectrum below of formic acid (46 g/mol).



i) What is the m/z value of the parent ion peak?

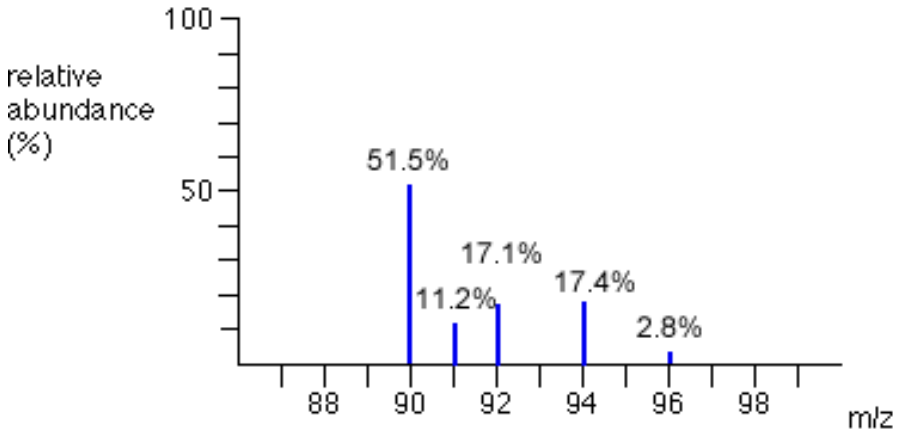
ii) What is the base peak

iii) What is the peak at 47 m/z due to?

iv) What fragment forms the peak at 29 (M/z) ?

2) The separation and identification of proteins is crucial to the identification of a particular disease.
Which of the following sequence of techniques could be used to
i. separate these molecules, then
ii. accurately determine their molecular mass, and then
iii. determine their molecular structure.
A. NMR spectroscopy, followed by mass spectrometry, followed by high-performance liquid chromatography
B. high-performance liquid chromatography, followed by mass spectrometry, followed by NMR spectroscopy
C. high-performance liquid chromatography, followed by infrared spectroscopy, followed by mass spectrometry
D. mass spectrometry, followed by high-performance liquid chromatography, followed by infrared

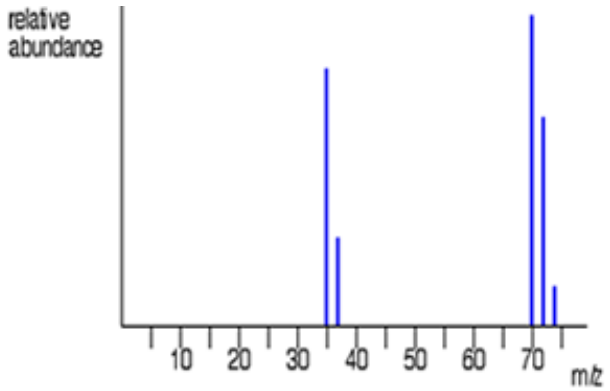
3) A sample of pure zirconium was analysed in a mass spectrometer. The following spectrum was obtained.



a) How many different isotopes are present in a sample of zirconium?

b) Calculate the relative atomic mass of zirconium.

4) Below is the mass spectrum of chlorine



a) Explain why there are two separate groups of peaks.

b) State what causes each of the 5 lines.

c) What can be deduced from the heights of the lines at m/z 35 and 37?