Peak splitting in NMR spectroscopy

A closer analysis of an NMR spectrum reveals that each signal on the graph represents one kind of proton present in the molecule. It is commonly observed that this signal is not always a single peak but has multiple peaks. This multiplicity of the signal is a very important determinant for the structure of the molecule. This phenomenon by which the spins of resonating protons cause the peaks on NMR spectrum to

Scanned with CamScanner

multiply is known as **peak splitting.** [6] The splitting of NMR signal gives precise information about the **number** of neighboring protons in a molecule. There is a formula to calculate the multiplicity of the peaks in the NMR spectrum.

$2nI + 1$

n= Number of neighboring protons

I= spin number of protons

Since I is always ½, we can rewrite the formula as n+1.

The other relevant information which comes along with knowing the number of peaks is the intensity of the peaks (which is seen as the height of the peaks). As a general rule, the height of the

Scanned with CamScanner

the number of peaks is the intensity of the peaks (which is seen as the height of the peaks). As a general rule, the height of the peaks or in other words, the relative intensities of the peaks can be determined by using Pascal's triangle. [7]

Scanned with CamScanner