

NMR - Questions

- ① What is NMR Spectroscopy?
- ② How I-Value can be Calculated?
- ③ Why N_7^{14} NMR Spectra is broad?
- ④ Why C_6^{12} does not give NMR Signal?
- ⑤ Why H_1^1 (Proton NMR) spectra gives sharp peak than N_7^{14} ?
- ⑥ What is the value of H_0 when the frequency is 600 MHz?
- ⑦ What is the value of β_2 and β_N in both CGS and SI unit?
- ⑧ Why proton in different molecular environment gives different signal position than a bare proton?
- ⑨ What is meant by Resonance Condition?
- ⑩ What is saturation Condition?
- ⑪ Why higher energy / higher ~~frequency~~ magnetic field is necessary in NMR spectroscopy?
- ⑫ Why ^{13}C is NMR active?
- ⑬ What is gyromagnetic ratio?
- ⑭ What is precessional frequency?
- ⑮ Calculate the NMR frequency (in MHz) on the proton (1H) in a magnetic field of intensity 1.4092 Tesla. Given that $g_N = 5.585$ and $\mu_N = 5.05 \times 10^{-27} \text{ JT}^{-1}$.
- ⑯ What is α and β - spin state?
- ⑰ What is Relaxation process? Give a brief discussion on spin-spin relaxation and spin-lattice relaxation.

(18) What is FT-NMR? What ~~are~~^{are the} advantages of FT-NMR over Continuous wave spectra?

(19) What is chemical shift?

(20) Why TMS is used as an internal standard?

(21) How chemical shift can be expressed?

(22) Why acetylenic proton shift higher field?

(23) What is Diamagnetic and Paramagnetic anisotropy?

(24) What is ring current?

(25) Give the qualitative NMR data of pure EtOH and hydrated EtOH. Explain the reason.

(26) What is Coupling Constant? How this can be measured?

(27)
$$\begin{array}{c} \text{H}_3\text{C}-\text{CH}_3 \\ | \\ \text{Cl}-\text{C}-\text{CH}_3 \\ | \\ \text{H} \end{array}$$
 } How many types of NMR signal are expected for these molecules? Give a detailed explanation on that.

(28) What is the meaning of 2J, 3J, 4J?

(29) What is multiplet skewing?

(30) What is 1st order and 2nd order spectra?

(31) Discuss Pascal's Triangle rule for the intensity of NMR peaks?

(32) What is decoupled spectrum?

(33) Explain the NMR peak shift by the dilution effect on intermolecular and intramolecular H-bonded molecule?

(34) Why ethylenic proton shifted downfield than acetylenic protons?

(35) If we change the operating frequency the δ remain the same. Justify or Criticise the statement.