

Unit 6 - One dimensional NMR of X-nuclei (¹³C, ¹⁵N, ³¹P and ¹⁹F)

Course outline

How does an NPTEL online course work?

Week 0 Assignment

Introduction to NMR spectroscopy

Chemical shifts and J-coupling

One-dimensional proton NMR

One dimensional NMR of X-nuclei (¹³C, ¹⁵N, ³¹P and ¹⁹F)

Basic aspects of 1D proton NMR analysis

Analysis of an example 1D proton spectrum

Analysis of 1D ¹H NMR spectra of molecules I

Analysis of 1D ¹H NMR spectra of molecules II

1D ¹³C NMR

Quiz : Week 4 Assignment

Homonuclear 2D NMR

Heteronuclear 2D NMR

Structure determination of molecules

Advanced topics (Solvent suppression, Drug Discovery, DOSY)

Text Transcripts

Weekly Feedback forms

Video download

Week 4 Assignment

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

Due on 2020-02-26, 23:59 IST.

1) How many types of proton peaks are expected in the 1D ¹H NMR spectrum of this molecule: (CH₃-CH₂)₃-C-CH₃

1 point

- 3
 4
 5
 6

No, the answer is incorrect.
Score: 0

Accepted Answers:
3

2) What will be the most likely approximate chemical shift of the CH proton in (CH₃)₂CH(OH)-CH₂-C₆H₅?

1 point

- 1.1 ppm
 2.1 ppm
 3.1 ppm
 4.1 ppm

No, the answer is incorrect.
Score: 0

Accepted Answers:
4.1 ppm

3) For the compound, (CH₃)₂-CH₂-O-CH₃, in the 1D ¹H NMR spectrum

1 point

- There should be a peak in the spectral region of 7-9 ppm
 There should be a peak in the spectral region 6-7 ppm
 There should be peak in the spectral region 3-5 ppm
 There should be a peak in the spectral region 9-10 ppm

No, the answer is incorrect.
Score: 0

Accepted Answers:
There should be peak in the spectral region 3-5 ppm

4) What will be the approximate chemical shift of the proton in 2-methyl-2-butane if Pascual Meir Simon rule is used

1 point

- 4.17 ppm
 5.17 ppm
 5.39 ppm
 5.5 ppm

No, the answer is incorrect.
Score: 0

Accepted Answers:
5.17 ppm

5) A compound with molecular formula C₄H₈O₂ had three types of peaks in the 1D ¹H NMR spectrum: (i) A triplet at 1.3 ppm with relative integral value of 3, (ii) a quartet at 2.5 ppm with relative integral value of 2 and (iii) a singlet at 3.7 ppm with relative integral value of 3. What is the possible molecular structure of the compound?

- CH₃-CH₂-COO-CH₃
 CH₃-COO-CH₂-CH₃
 CH₃-CH₂-CO-CH₂OH
 HO-CH₂-CH₂-CO-CH₃

No, the answer is incorrect.
Score: 0

Accepted Answers:
CH₃-CH₂-COO-CH₃

6) Which of the following compounds will have 5 types of proton peaks in a 1D ¹H NMR spectrum?

1 point

- (CH₃)-(CH₂)₆-OH
 (CH₃CH₂)₃C-OH
 (CH₃)₃C-(CH₂)₃-OH
 None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
(CH₃)₃C-(CH₂)₃-OH

7) If the magnetic field (B₀) is 9.39 T, what would be the ¹³C resonance frequency?

1 point

- 70 MHz
 125 MHz
 100.6 MHz
 350 MHz

No, the answer is incorrect.
Score: 0

Accepted Answers:
100.6 MHz

8) In the 1D ¹³C NMR spectrum of CH₃-CH₂-CH₃ at natural abundance, how many lines/peaks are expected if decoupling of ¹H is Not carried out?

1 point

- 4 peaks
 5 peaks
 6 peaks
 7 peaks

No, the answer is incorrect.
Score: 0

Accepted Answers:
7 peaks

9) What would be the approximate ¹³C chemical shift value of the aromatic carbon atom of 1,4-dimethylbenzene (CH₃-C₆H₄-CH₃)?

1 point

- 85 ppm
 105 ppm
 130 ppm
 170 ppm

No, the answer is incorrect.
Score: 0

Accepted Answers:
130 ppm

10) Which of the following compounds will show two peaks in the ¹³C 1D spectrum.

1 point

- (CH₃)₂CH-COOH
 CH₃-CH₂-CH₂-OH
 CH₃-CHOH-CH₃
 CH₃-CO-CH₂-OH

No, the answer is incorrect.
Score: 0

Accepted Answers:
CH₃-CHOH-CH₃