

Unit 7 - Homonuclear 2D NMR

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)

Homonuclear 2D NMR

Why do we need 2D NMR

A qualitative explanation of how 2D NMR experiment works

Principles of 2D COSY and Total correlation spectroscopy
2D TOCSY

2D NOE spectroscopy

2D NOESY and 2D ROESY

Quiz : Week 5 Assignment

Heteronuclear 2D NMR

Structure determination of molecules

Advanced topics (Solvent suppression, Drug Discovery, DOSY)

Text Transcripts

Weekly Feedback forms

Video download

Week 5 Assignment

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

Due on 2020-03-04, 23:59 IST.

1) Which of the following NMR experiments helps in giving 3D structural information in a molecule? 1 point

- 2D COSY
 2D NOESY
 2D TOCSY
 2D HSQC

No, the answer is incorrect.
Score: 0

Accepted Answers:
2D NOESY

2) In which of the following NMR experiments, the magnetization is transferred among all spins in spin system having through space interactions (through dipolar coupling)? 1 point

- NOESY
 TOCSY
 COSY
 None of the above

No, the answer is incorrect.
Score: 0

Accepted Answers:
NOESY

2) Which of the following mixing times is most likely used in a 2D NOESY for small molecules? 1 point

- 20 ms
 50 ms
 100 ms
 300 ms

No, the answer is incorrect.
Score: 0

Accepted Answers:
300 ms

4) Which of the following is NOT true about 2D COSY and 2D TOCSY 1 point

- There are more peaks in 2D COSY spectrum compared to 2D TOCSY
 There are more peaks in 2D TOCSY compared to 2D COSY
 In 2D TOCSY a mixing time is involved but not in 2D COSY
 2D COSY and 2D TOCSY gives connectivity information

No, the answer is incorrect.
Score: 0

Accepted Answers:
There are more peaks in 2D COSY spectrum compared to 2D TOCSY

5) In the 2D COSY spectrum of CH₃-CH₂-CH₃, how many peaks total peaks (diagonal + cross peaks) will be observed? 1 point

- 2
 3
 4
 6

No, the answer is incorrect.
Score: 0

Accepted Answers:
4

6) In a 2D experiment, what is the correct sequence of the different parts of experiment? 1 point

- Preparation period, Decoupling, Mixing, Evolution
 Preparation period, Evolution, Mixing, Detection
 Preparation period, Mixing, Evolution, Detection
 Preparation period, Evolution, Mixing, Decoupling

No, the answer is incorrect.
Score: 0

Accepted Answers:
Preparation period, Evolution, Mixing, Detection

7) Two protons have chemical shift of 6 and 6.05 ppm on a 400 MHz NMR spectrometer. What is the value of J-coupling between them that will result in a strong coupling situation? 1 point

- 5 Hz
 10 Hz
 15 Hz
 20 Hz

No, the answer is incorrect.
Score: 0

Accepted Answers:
20 Hz

8) Which of the following parameters affects the dynamic range in an NMR spectrum? 1 point

- Relaxation delay between scans
 The relative concentration of the solute and solvent
 Number of scans used
 Total measurement time

No, the answer is incorrect.
Score: 0

Accepted Answers:
The relative concentration of the solute and solvent

9) For which of the following compounds, only diagonal peaks will be observed in a 2D COSY and 2D TOCSY Spectrum 1 point

- CH₃-CH₂-O-CH₃
 CH₃-O-CH₂-CO-CH₃
 CH₃-CO-CH₂-CH₃
 CH₃-CH(OH)-CH₃

No, the answer is incorrect.
Score: 0

Accepted Answers:
CH₃-O-CH₂-CO-CH₃

10) What is the rotational correlation time (tau-c) of a molecule having a molecular weight of 5000? 0 points

- 0.5 ns
 1 ns
 2.5 ns
 5 ns

No, the answer is incorrect.
Score: 0

Accepted Answers:
0.5 ns