Document details - Principles of Nuclear Magnetic Resonance and Pulsed Nuclear Magnetic Resonance

Spin Resonance Spectroscopy: Principles and applications

4 January 2018, Pages 1-42

Principles of Nuclear Magnetic Resonance and Pulsed Nuclear Magnetic Resonance
(Book Chapter)

Karunakaran, C., Rajkumar, R., Balamurugan, M.

VHNSN College (Autonomous), Virudhunagar, India

Abstract

Spin resonance spectroscopy deals with the nuclear and electron spin resonance absorptions in the radio and microwave frequencies used for investigating diamagnetic (I. ≥. 1/2) and paramagnetic (S. ≥. 1/2) systems, respectively. This chapter focuses on the theory of nuclear magnetic resonance (NMR), its instrumentation, and comparison with electron paramagnetic resonance spectroscopy. The parameters obtained from NMR viz., chemical shift and spin-spin splitting including their types (first and second orders), characteristics, and mechanisms (dipolar and indirect scalar coupling) are discussed. Furthermore, the classification of NMR systems including chemically and magnetically equivalent nuclei is presented. The simplification techniques for complex NMR spectra are also highlighted. It also includes the principles of pulse and Fourier transform NMR and different methods viz., free induction decay, saturation recovery, spin echo (SE), inversion recovery, and stimulated SE to investigate the relaxation process and times. The time evolution of magnetization is described by Bloch equation. The different lineshapes and factors affecting line width are also discussed. © 2018 Elsevier Inc. All rights reserved.

Author keywords

Chemical shift | Coupling constant | FID | Lineshape and line width | NMR spin system | Relaxation times | Spin echo

ISBN: 978-012813609-6;978-012813608-9
DOI: 10.1016/B978-0-12-813608-9.00001-0
Source Type: Book
Document Type: Book Chapter
Original language: English
Publisher: Elsevier

Karunakaran, C.; VHNSN College (Autonomous), Virudhunagar, India

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Wiström, E. , Hyacinthe, J.-N. , Lê, T.P.

^{129}Xe Dynamic Nuclear Polarization Demystified: The Influence of the Glassing Matrix on the Radical Properties

(2024) Journal of Physical Chemistry Letters

de Melo, D.F. , Guedes, G.G. , Moreira, L.M.C.C.

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(2023) Current Pharmaceutical Design

Kolouchova, K. , Jirak, D. , Groborz, O.

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