1. Record Nr. UNINA9910784592503321 Autore Balci Metin Titolo Basic 1H- and 13C-NMR spectroscopy [[electronic resource] /] / Metin Balci Pubbl/distr/stampa Amsterdam;; Boston,: Elsevier, 2005 **ISBN** 1-281-02542-9 9786611025427 0-08-052553-9 Edizione [1st ed.] Descrizione fisica 1 online resource (441 p.) Disciplina 543.66 Soggetti Nuclear magnetic resonance spectroscopy Spectrum analysis Lingua di pubblicazione Inglese **Formato** Materiale a stampa Livello bibliografico Monografia Note generali Numbers in title in superscript. Nota di bibliografia Includes bibliographical references and index. Nota di contenuto Front Cover; Basic 1H- and 13C-NMR Spectroscopy; Copyright Page; Preface; Contents; Part I: 1H-NMR Spectroscopy; Chapter 1. Introduction: 1.1 Structure Elucidation and NMR: 1.2 Development of NMR Spectroscopy; Chapter 2. Resonance Phenomena; 2.1 Magnetic Properties of Atomic Nuclei; 2.2 Spin Quantum Numbers of Elements; 2.3 Behavior of an Atomic Nucleus in a Magnetic Field; 2.4 Relaxation; 2.5 NMR Instrumentation; Chapter 3. Chemical shift; 3.1 Local Magnetic Fields Around a Nucleus; 3.2 The Unit of the Chemical Shift; 3.3 Sample Preparation; 3.4 Factors Influencing the Chemical Shift 3.5 Exercises 1-30 Chapter 4. Spin-Spin Splitting in 1H-NMR Spectra; 4.1 Explanation of Spin-Spin Splitting; 4.2 Spin-Spin Coupling Mechanism; 4.3 Factors Influencing Spin-Spin Coupling Constants; Chapter 5. Spin-Spin Splitting to Different Protons; 5.1 General Rules; 5.2 Examples of Coupling with Different Protons; 5.3 Exercises 31-60; Chapter 6. Spin Systems: Analysis of the 1H-NMR Spectra; 6.1 Secondorder Spectra; 6.2 Two-spin Systems; Chapter 7. NMR Shift Reagents and Double Resonance Experiments: Simplification of the NMR Spectra; 7.1 Shift Reagents; 7.2 Double Resonance Experiments Chapter 8. Dynamic NMR Spectroscopy 8.1 Basic Theories; 8.2

Exercises 61-101; Part II: 13C-NMR Spectroscopy; Chapter 9. Introduction; 9.1 Development of 13C-NMR Spectroscopy; 9.2

Comparison of the 'H and 13C Nucleus; 9.3 The Factors Influencing The Sensitivity Of The 13c Nucleus; 9.4 The Factors Increasing the Sensitivity In 13C-NMR Spectroscopy; Chapter 10. Absorption and Resonance; 10.1 Classical Treatment of Absorption and Resonance; 10.2 Relaxation Processes; Chapter 11. Pulse NMR Spectroscopy; 11.1 Introduction to the Pulse NMR Spectroscopy; 11.2 CW and FT Spectroscopy

11.3 Interaction of a Monochromatic Radio frequency With the Sample 11.4 Fourier Transformation: 11.5 Routine Pulsed 13C-NMR Measurement Techniques; 11.6 Broadband Decoupling; 11.7 Nuclear Overhauser Effect; 11.8 Measurements of NOE Enhanced Coupled 13C-NMR Spectra: Gated Decoupling; 11.9 Off Resonance 1H Decoupled and Selective Decoupled Experiments: 11.10 Inverse Gated Decoupling: 11.11 Sample Preparation and Solvents; Chapter 12. Chemical Shift; 12.1 Diamagnetic and Paramagnetic Shielding on Proton and Carbon Atoms: 12.2 Factors which Influence the Chemical Shifts Chapter 13. 13C Chemical Shifts of Organic Compounds 13.1 Alkanes; 13.2 Substituted Alkanes: 13.3 Cycloalkanes: 13.4 Alkenes: 13.5 Aromatic Compounds: 13.6 Carbonyl Compounds: 13.7 Heterocyclic Compounds; Chapter 14. Spin-Spin Coupling; 14.1 Couplings Over One Bond (1JCH): 14.2 Couplings Over Two Bonds (2JcH) (Geminal Coupling); 14.3 Couplings Over Three Bonds (3JcH) (Vicinal Coupling); 14.4 Carbon-Deuterium Coupling (1JcD); Chapter 15. Multiple-Pulse NMR Experiments; 15.1 Measurements of Relaxation Times; 15.2 J-Modulated Spin-echo Experiments

15.3 Signal Enhancement by Population Transfer: Selective Population Transfer and Selective Population Inversion

## Sommario/riassunto

Nuclear Magnetic Resonance (NMR) spectroscopy is a powerful and theoretically complex analytical tool. Basic 1H- and 13C-NMR Spectroscopy provides an introduction to the principles and applications of NMR spectroscopy. Whilst looking at the problems students encounter when using NMR spectroscopy, the author avoids the complicated mathematics that are applied within the field. Providing a rational description of the NMR phenomenon, this book is easy to read and is suitable for the undergraduate and graduate student in chemistry.\* Describes the fundamental principles of the pulse