

Preface

This book in the Springer Brief Series intends to be an easy and concise introduction to the field of nuclear magnetic resonance or NMR, which has revolutionized life sciences in the past 20 years. A significant part of the progress observed in scientific areas like Chemistry, Biology or Medicine can be ascribed to the development experienced by NMR in recent times. Many of the books currently available on NMR deal with the theoretical basis and some of its main applications, but they generally demand a strong background in Physics and Mathematics for a full understanding. This book is aimed to a wide scientific audience, trying to introduce NMR by making all possible effort to remove, without losing any formality and rigor, most of the theoretical jargon that is present in other NMR books. Furthermore, we have provided illustrations showing all the basic concepts using a naive vector formalism, or using a simplified approach to the particular NMR-technique described. Our intention has been to show simply the foundations and main concepts of NMR, rather than seeking thorough mathematical expressions.

The book is organized into four chapters. [Chapter 1](#) introduces the basis of NMR; furthermore, a concise description of how the magnet works and the instrumental set-up is provided at the end of this chapter. [Chapter 2](#) describes the different spectroscopic parameters in NMR such as the chemical shift and the spin coupling, which will be used in the following chapters. [Chapter 3](#) describes some basic experiments in NMR, starting from the basic one-dimensional experiment and continuing with the principles of multi-dimensional experiments. The last chapter describes the most successful applications of NMR in Biochemistry, from structural elucidation to drug-discovery and metabolomics.

We believe that the target audience for this book will be undergraduate and graduate students willing to give their first steps in the NMR field. The book can be used as a complement for courses of Analytical Techniques or Advanced Techniques in the Grades of Biochemistry, Biotechnology, Pharmacy or Biology. It has been also written for lecturers in the above disciplines who want to take a first look on general concepts of NMR or get more information about the subject for their respective research fields. We hope that even readers not familiar with the topic, but curious enough to increase their general knowledge, will find this book useful.

Trying to keep in mind the ample width of the intended audience, the book has been revised by scientists with different backgrounds and expertises. We are indebted to Francisco N. Barrera (Yale University), Ana Cámara (Almería University), and Tennie Videler (Cambridge University) for their many helpful suggestions and corrections. We are also deeply indebted to Thijs van Vlijmen and Sara Germans, our editors in Springer, for their patience, help, and corrections to the early version of the manuscript. However, any error left in the text the reader is now holding, is our sole responsibility.

We are delighted to receive any suggestions from the readers to correct, modify, or improve the clarity of the text. Moreover, we hope that you all enjoy the book and will use it as a gateway for understanding the fascinating and burgeoning world of NMR.

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NMR for Chemists and Biologists

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