## Guide to Fluorine NMR for Organic Chemists

Fluorine is undeniably an unusual and fascinating element, which attracts the interest of the academic, medical, and industrial communities. The wide spectrum of possible applications of fluorinated molecules has stimulated the discovery of new fluorinating reagents and fluorination processes, and has posed fundamental questions about how fluorine affects physical and chemical properties. Many organic chemists who have chosen to contribute to the field are faced with the necessity of mastering fluorine NMR spectroscopy, a territory that is less familiar than proton or carbon NMR spectroscopy, at least for beginners. This recently published monograph written by Professor W. R. Dolbier, a leading world expert in the study of molecules containing fluorine, tells you all that you need to know about fluorine NMR spectroscopy, and therefore it is a superb and indispensable book that everyone interested in any aspect of fluorine chemistry should possess. The book, which is written with great clarity, assumes some basic knowledge of NMR spectroscopy, but guides the user through all aspects of fluorine NMR spectroscopy with seven chapters of progressive complexity. It is an essential reference source for all institutions with $^{19}F$ NMR capability.

The book opens with two chapters summarizing some of the unique properties of the fluorine atom, with an emphasis on steric size, polar effects, $pK_a$ or $pK_b$, lipophilicity, and some fundamental aspects of fluorine NMR spectroscopy. These include chemical shifts, spin-spin coupling constants, $^{1}H$ and $^{13}C$ NMR spectroscopy of organofluorine compounds, isotope effects on chemical shifts, and multidimensional $^{19}F$ NMR spectroscopy. The next five chapters are organized in a logical way, with an increasing number of fluorine substituents. Monofluorinated compounds are covered comprehensively in the third and longest chapter, which contains about 100 schemes, tables, and figures packed with chemical shifts, coupling constants, and detailed and clearly presented interpretations of $^{1}H$, $^{13}C$, and $^{19}F$ NMR spectra. Saturated compounds, unsaturated compounds, and aromatic and heteroaromatic fluorine compounds are discussed in turn, general features and patterns for signature recognition are described, and detailed points of interest are mentioned. In a similar vein, Chapters 4 and 5 focus on the NMR characterization of $CF_2$ and $CF_3$ groups, respectively. With the advent of light fluorous chemistry, the section that covers more highly fluorinated groups is most useful and of a high standard (Chapter 6). The last chapter deals with compounds that have one or more fluorine atoms bonded directly to a heteroatom (B, Si, N, P, O, or S). This is a very useful addition, which will benefit chemists who are interested in understanding the factors that govern trends in fluorine chemical shifts or in undertaking mechanistic studies to discover new reactions. Species with the fluorine bonded to a metal (e.g., Pd or Ni) are not covered, but instead the reader is invited to look at specialized research papers to have a fuller appreciation of NMR trends in a more inorganic context. However, trifluoromethyl organometallic species are discussed briefly, and some useful data are presented.

The flawless ordering of material covered in this stand-alone volume is such that information can be found very easily, and the index becomes almost superfluous. This collection of competently written chapters gives a very good overview of many aspects of fluorine NMR spectroscopy. It contains discussions and data for about 1000 compounds, and provides the working chemist and the advanced student with an essential tool for the characterization of fluorinated organic compounds. I am confident that this book will become a favorite main reference source and will reside on many fluorine chemists' bookshelves.

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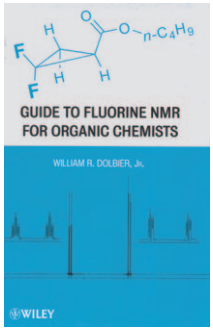


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