

The main objective of this volume is to provide readers with comprehensive discussions of recent results obtained in the field of nitroxides and related compounds and to present readers with in-depth analysis of avenues for future developments in this growing area.

Written by a group of long-proven experts in chemistry, physical chemistry, biochemistry and biophysics of nitroxides, this book lays out theoretical and experimental basis and applies it to a variety of practical examples in these diverse but interrelated fields. The first four chapters expound the general theoretical and experimental essentials of nitroxide bulk magnetic and magnetic resonance properties as well as advantages of modern ESR techniques. Chapter 5 focuses on fundamentals and recent results in chemical synthesis and basic chemical properties of nitroxides, while the following two chapters briefly outline the principles and current results in employing these compounds for investigating molecular structure and dynamics, and as redox probes and spin traps. These chapters form the basis for subsequent and more detailed discussion of molecular property studies of various paramagnetic metal systems. The following chapters concentrate on advantages of designing and investigating magnetic materials on the basis of nitroxides as well as reviewing recent spin labeling results in studies of molecular structure, dynamics and functional activity of proteins, enzymes, biomembranes, nucleic acids, and polysaccharides. Finally, concluding chapter considers rapidly developing fields of biomedical, therapeutic and clinical applications of nitroxides.

With numerous references to essential literature, this volume provides chemical, biochemical, biomedical and materials science researchers with a tool to rapidly gain fundamental knowledge in instrumentation, data interpretation, capacity and recent advantages of nitroxide applications, and take them to the level of employing nitroxide in their research fields on their own. The book is equally suitable as a subsidiary text for instructors, and graduate and undergraduate students in biochemical and chemical departments.

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