

1. Record Nr.	UNINA9910830162003321
Titolo	Nitroxides : applications in chemistry, biomedicine, and materials science // Gertz I. Likhtenshtein [and four others]
Pubbl/distr/stampa	Weinheim, Germany : , : WILEY-VCH Verlag GmbH & Co. KGaA, , 2008 ©2008
ISBN	1-282-78441-2 9786612784415 3-527-62174-1 3-527-62175-X
Descrizione fisica	1 online resource (441 p.)
Disciplina	547.041 661.65
Soggetti	Nitroxides
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references at the end of each chapters and index.
Nota di contenuto	Nitroxides; Contents; Preface; Symbols and Abbreviations; 1 Fundamentals of Magnetism; 1.1 Magnetism of Materials; 1.1.1 Historical Background; 1.1.2 Magnetic Moment and its Energy in a Magnetic Field; 1.1.3 Definitions of Magnetization and Magnetic Susceptibility; 1.1.4 Diamagnetism and Paramagnetism; 1.1.5 Classification of Magnetic Materials; 1.1.6 Important Variables, Units, and Relations; 1.2 Origins of Magnetism; 1.2.1 Origins of Diamagnetism; 1.2.2 Origins of Paramagnetism; 1.2.3 Magnetic Moments; 1.2.4 Specific Rules for Many Electrons; 1.2.5 Magnetic Moments in General Cases 1.2.6 Zeeman Effect 1.2.7 Orbital Quenching; 1.3 Temperature Dependence of Magnetic Susceptibility; 1.3.1 The Langevin Function of Magnetization and the Curie Law; 1.3.2 The Brillouin Function of Magnetization and the Curie Law; 1.3.3 The Curie-Weiss Law; 1.3.4 Magnetic Ordered State; 1.3.5 Magnetic Interactions; 1.3.5.1 Exchange Interaction; 1.3.5.2 Dipolar Interaction; 1.3.6 Spin Hamiltonian; 1.3.7 Van Vleck Formula for Susceptibility; 1.3.8 Some Examples of the van

Vleck Formula; 1.3.8.1 The Curie Law; 1.3.8.2 Zero-Filed Splitting Case; 1.3.8.3 Spin Cluster Case-The Dimer Model
1.3.8.4 Multiple-spin Cluster Case - The Triangle or Others
1.3.8.5 Temperature-Independent Paramagnetism; 1.3.9 Low-Dimensional Interaction Network; 1.4 Experimental Magnetic Data Acquisition; 1.4.1 Methods; 1.4.2 Evaluations of Magnetic Susceptibility and Magnetic Moment; References; 2 Molecular Magnetism; 2.1 Magnetic Origins from Atoms and Molecules; 2.1.1 Historical Background; 2.1.2 Spin States Derived from Chemical Bonds; 2.1.3 Organic Free Radicals; 2.1.4 Coordinate Compounds; 2.2 Characteristics of Molecular Magnetism; 2.2.1 Molecular Paramagnetism
2.2.2 Magnetic Properties of Organic Free Radicals
2.3 Nitroxide as a Building Block; 2.3.1 Stability of the N-O Bond; 2.3.2 Structural Resonance of the N-O Bond; 2.3.3 Molecular and Magnetic Interactions between Nitroxides; 2.3.4 Nitroxides as Building Block; 2.4 Low-Dimensional Properties of Nitroxides; 2.4.1 One-Dimensional Magnetism; 2.4.1.1 TANOL (TEMPOL); 2.4.1.2 F(5)PNN; 2.4.2 Interchain Interaction and Spin Long-Range Ordering; 2.4.3 Two-Dimensional Magnetism; 2.4.3.1 DANO; 2.4.3.2 p-NPNN; 2.4.4 Coordination of Nitroxide with Metal Ions; 2.4.4.1 Cu(2+), Mn(2+)-TANOL (TEMPOL)
2.4.4.2 Mn(2+)-IPNN
References; 3 Fundamentals of Electron Spin Resonance (ESR); 3.1 Magnetic Resonance of Electron and Nuclear Spins; 3.1.1 Historical Background; 3.1.2 Classification of Magnetic Resonance; 3.2 Principle of Electron Spin Resonance (ESR); 3.2.1 Principle of ESR from Spectroscopic Interpretation; 3.2.2 Principle of ESR from Resonance Interpretation; 3.2.3 Bloch Equation; 3.2.3.1 Solutions of the Bloch Equation; 3.2.3.2 Absorption Line Shape; 3.2.3.3 Relaxation Times; 3.2.4 Modified Bloch Equation; 3.2.5 Hyperfine Interaction
3.2.5.1 Interaction of the Electron Spin with Nuclear Spins

Sommario/riassunto

Covering all aspects of this field, this volume also critically discusses recent results obtained with the use of nitroxides, while providing an analysis of future developments. Written by a group of scientists with long-term experience in investigating the chemistry, physicochemistry, biochemistry and biophysics of nitroxides, the book is not intended as an exhaustive survey of each topic, but rather a discussion of their theoretical and experimental background, as well as recent advances. The first four chapters expound the general theoretical and experimental background and the advan
