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The Chemistry of the Fullerenes; Contents; Chapter 1. The Parent Fullerenes; 1.1 The Fullerenes: Molecular Allotropes of Carbon; 1.2 The Discovery of the Fullerenes; 1.3 Fullerene Production; 1.3.1 Fullerene Generation by Vaporization of Graphite; 1.3.1.1 Resistive Heating of Graphite; 1.3.1.2 Arc heating of Graphite; 1.3.1.3 Solar Generators; 1.3.1.4 Inductive Heating of Graphite; 1.3.2 Fullerene Synthesis in Combustion; 1.3.3 Formation of Fullerenes by Pyrolysis of Naphthalene; 1.3.4 Endohedrals; 1.3.5 The Formation Process; 1.4 Separation and Purification; 1.5 Properties; 1.5.1 Structures 1.5.2 Physical and Spectroscopic PropertiesReferences; Chapter 2. Reduction; 2.1 Introduction; 2.2 Fulleride Anions; 2.3 Reductive Electrosynthesis; 2.3.1 Electrocrystallization; 2.3.2 Electrophilic Additions to Fulleride Anions; 2.4 Reduction with Metals; 2.4.1 Alkali Metal Fullerides; 2.4.1.1 Generation in Solution and Quenching Experiments; 2.4.1.2 Synthesis and Properties of Alkali Metal Fulleride Solids; 2.4.2 Alkaline Earth Metal Fullerides; 2.4.3 Reduction with Mercury; 2.5 Reduction with Organic Donor Molecules; References; Chapter 3. Nucleophilic Additions; 3.1 Introduction 3.2 Addition of Carbon Nucleophiles3.2.1 Hydroalkylation and Hydroarylation of C₆₀ and C₇₀; 3.2.2 Langmuir - Blodgett Films of C₆₀Ht-Bu; 3.2.3 Addition of Macromolecular Carbanions - Fullerene Polymers; 3.2.4 Cyclopropanation of C₆₀ and C₇₀; 3.3 Addition of Amines; 3.4 Addition of Hydroxide; References; Chapter 4. Cycloadditions; 4.1 Introduction; 4.2 [4+2] Cycloadditions; 4.3 [3+2] Cycloadditions; 4.3.1 Addition of Diazomethanes. Diazoacetates and Diazoamides; 4.3.2 Addition of Azides; 4.3.3 Addition of Trimethylenemethanes; 4.3.4 Addition of Azomethine Ylides 4.3.5 Addition of Nitrile Oxides4.3.6 Addition of Sulfinimides; 4.3.7 Addition of Disiliranes; 4.4 [2+2] Cycloadditions; 4.4.1 Addition of Benzyne; 4.4.2 Addition of Enones; 4.4.3 Addition of Quadricyclane; 4.4.4 Addition of Electron Rich Alkynes; 4.4.5 Photopolymerization of C₆₀; 4.5 [2+1] Cycloadditions; 4.5.1 Addition of Carbenes; 4.5.2 Addition of Silylenes; References; Chapter 5. Hydrogenation; 5.1 Introduction; 5.2 Oligohydrofullerenes C₆₀H_{2n} and C₇₀H_{2n} (n = 1 - 6); 5.2.1 Hydrogenation via Hydroboration, Hydrozirconation and Zinc/Acid Reduction; 5.2.2 Theoretical Investigations 5.3 Polyhydrofullerenes C₆₀H_{2n} and C₇₀H_{2n} (n = 7 - 70)5.3.1 Birch - Huckel Reduction; 5.3.2 Transfer Hydrogenation of C₆₀ and C₇₀; 5.3.3 Catalytic Hydrogenation; 5.3.4 Theoretical Investigations; References; Chapter 6. Radical Additions; 6.1 Introduction; 6.2 ESR Investigations of Radical Additions; 6.2.1 Addition of Single Radicals; 6.2.2 Multiple Radical Additions; 6.3 Metalation of C₆₀ with Pentacarbonylrhenium Radicals; 6.4 Hydrostannylation of C₆₀; 6.5 Addition of Bis (trifluoromethyl)nitroxide; 6.6 Radical Copolymerization of C₆₀ and Paracyclophane; References Chapter 7. Transition Metal Complex Formation

Although synthetic fullerenes have only been around for a few years, there are thousands of scientific articles dealing with them. This is the first monograph in the field and thus represents a vital source of information summarizing the most important and fundamental aspects of the organic and organometallic chemistry of the fullerenes. The book is logically arranged so that information is easy to retrieve, and the style lends itself to effortless reading and to learning more about the chemical properties of a family of molecules that constitute new building blocks for novel architectures