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Sommario/riassunto

Discover the transformative potential of porphyrin-based composites in Porphyrin-Based Composites where readers will learn how these innovative materials enhance industrial sectors by combining multiple porphyrin components to create durable, sensitive, and efficient technologies that outperform traditional materials. This book highlights the benefits of adopting porphyrin composites and discusses how they are used in different industrial sectors. Combining multiple porphyrin components is used to create materials with properties that are not possible with individual components, remove restrictions of water-insolubility, and ultimately lead to the development of durable and more sensitive technological materials. Composite materials have been essential to human life for thousands of years, beginning with the construction of houses by the first civilizations and advancing to modern technologies. Originating in the mid-twentieth century, composite materials show promise as a class of engineering materials that offer new opportunities for contemporary technology and have been beneficially incorporated into practically every sector due to their ability to choose elements, tune them to achieve the desired qualities, and efficiently use those features through design. Additionally, composite materials offer greater strength- and modulus-to-weight ratios than standard engineering materials. Materials based on porphyrin composites are used in a wide range of applications, including sensors, molecular probes, electrical gadgets, electronic devices, construction materials, catalysis, medicine, and environmental and energy applications. Readers will find the book: Provides an overview of several porphyrin composites as model materials for commercial settings; Discusses fundamental, experimental, and theoretical research on structural and physicochemical properties of porphyrin composites; Demonstrates how complementary and alternative material designs that use porphyrin composites have evolved; Emphasizes important uses for cutting-edge, multipurpose materials that might contribute to a more sustainable society; Opens new possibilities by examining the role of developing unique hybrid, composite, and higher-order hierarchical materials that may be utilized to make valuable chemicals. Audience Researchers, academicians, chemists, industry experts, and students working in the fields of materials and environmental sciences, engineering, textiles, biology, and medicine.
