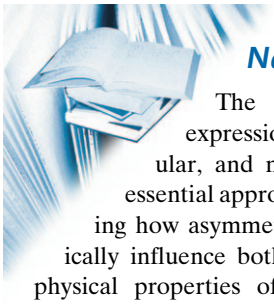

Chirality at the Nanoscale

The investigation of chiral expression at the atomic, molecular, and macroscopic levels is an essential approach towards understanding how asymmetric systems can dramatically influence both the structural and the physical properties of natural and synthetic molecular architectures. This very topical and timely book on chiral materials edited by David Amabilino in the Wiley-VCH series is a multi-authored work consisting of 12 chapters that describe, in all the various facets, the expression of chirality in different contexts of the nanoscale world.

In its essence, the book covers the main approaches for the engineering of chiral one-, two-, and three-dimensional nanostructures of all categories of materials, ranging from organic to inorganic substrates, including polymers, composites, light-switchable materials, and hybrid organic–inorganic systems based on metal coordination interactions. The authors have succeeded in merging all the aspects, including the structural, chemical, and physical properties. They describe the wide range of experimental techniques used to characterize the materials (scanning probe microscopies, transmission and scanning electron microscopies, x-ray diffraction, and nuclear magnetic resonance, to name just a few) and the various preparative techniques (Langmuir and Langmuir–Blodgett thin films, organic vapor deposition, and solution and solid-state methods).

Although some synthetic methods are described in detail, as in Chapters 2 and 12, the reader should not expect to find a lot of purely synthetic protocols on how to introduce asymmetry into molecules (e.g., by classical stereoselective catalysis), as the focus of the book is not centered on the generation of "molecular" chirality.

One of the most valuable contributions in the book is the first chapter, which contains a thoughtful, scholarly, and articulate discussion about how to describe the fundamental concept of chirality, taking into account the increasing complexity of different systems of higher dimensionality. My only suggestion for future editions or series in the field is to include the fascinating topic of intrinsically chiral solid surfaces, which are attracting increasing interest, as they could play a significant role in future developments in catalysis and nanotechnology.

The great value of this book lies in the way that it pulls together in one place the present state of knowledge about how one can induce chirality at the nanoscale level. Underlying that, through its different structural and functional facets, is the key role of the external boundary conditions (in solid-phase, liquid-phase, or liquid-crystalline media), along with that of the interface (solid–liquid, vacuum–solid, or air–liquid), the latter being often forgotten by chemists. In achieving that, it fills a particular niche, when compared to the various other books on chirality that are available, and certainly all chemists, whether or not they are interested in chirality, should have a copy of this work on their bookshelves. Because of its wide-ranging and interdisciplinary content, it is also strongly recommended for libraries.

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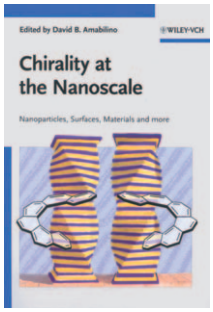
DOI: 10.1002/anie.200905648



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Nanoparticles, Surfaces, Materials and more. Edited by David B. Amabilino. Wiley-VCH, Weinheim 2009. 418 pp., hardcover € 149.00.—ISBN 978-3527320134