Fragments of Fullerenes and Carbon Nanotubes. Designed Synthesis, Unusual Reactions, and Coordination Chemistry

Description:
Open geodesic polyaromatic molecules, or "buckybowls": new research findings, syntheses, and reactions

The day is rapidly approaching when scientists will have the tools necessary to exploit the tremendous potential of carbon nanotubes, fullerenes, and endohedral fullerene complexes of predetermined structures. Reviewing the latest research into geodesic polyaromatic molecules, this contributed work focuses on their synthesis and reactivity in metal-binding reactions. Readers will find expert coverage of all aspects of fullerene fragment chemistry, including current synthetic techniques, molecular geometry, solid state packing, physical properties, and new buckybowl-based molecules and materials. Readers will also discover the implications of the latest fundamental research examining open geodesic polyarennes that map onto the surfaces of fullerenes.

The first part of this book describes research on the synthesis, chemistry, properties, and potential applications of various fullerene fragments and their derivatives. The second half of the book focuses on the development of methods needed for the rational chemical synthesis of single–chirality, uniform–diameter carbon nanotubes. Individual topics include:

- Molecular clips and tweezers with corannulene pincers
- Anions of buckybowl
- Coordination preferences of bowl-shaped polyarennes
- Experimental and calculated properties of fullerene and nanotube fragments
- Synthesis and complexation of sumanenes
- Aromatic belts as sections of nanotubes
- Conjugated molecular belts based on 3-D benzannulene systems

Each chapter, written by one or more leading investigators in the field, presents the latest research breakthroughs in North America, Europe, and Asia, offering not only a review of the current literature, but also perspectives from the authors’ first-hand experience in the lab. As a result, readers can confidently turn to this book to advance their own investigations into the synthesis, reactions, and coordination chemistry of fullerene fragments and carbon nanotubes.

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