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Nota di contenuto

Ideas in Chemistry and Molecular Sciences; Contents; Preface; List of Contributors; Part I Preparation of New Materials and Nanomaterials; 1 Self-Assembling Cyclic Peptide-Based Nanomaterials; 1.1 Introduction; 1.2 Types of Self-Assembling Cyclic Peptide Nanotubes; 1.2.1 Nanotubular Assemblies from Cyclic D,L--Peptides; 1.2.1.1 Solid-State Ensembles: Microcrystalline Cyclic Peptide Nanotubes; 1.2.1.2 Solution Phase Studies of Dimerization; 1.2.2 Nanotubular Assemblies from Cyclic -Peptides; 1.2.3 Nanotubular Assemblies from Other Cyclic Peptides; 1.3 Applications of Cyclic Peptide Nanotubes 1.3.1 Antimicrobials 1.3.2 Biosensors; 1.3.3 Biomaterials; 1.3.4 Electronic Devices; 1.3.5 Photoswitchable Materials; 1.3.6 Transmembrane Transport Channels; 1.4 Nanotubular Assemblies from Cyclic , -Peptides; 1.4.1 Design; 1.4.2 Homodimers Formation; 1.4.3 Heterodimers Formation; 1.4.4 Applications; 1.4.4.1 Artificial Photosystems; 1.4.4.2 Multicomponent Networks: New Biosensors; 1.4.4.3 Other Applications; 1.5 Summary and Outlook; References; 2 Designer Nanomaterials for the Production of Energy and High Value-Added Chemicals; 2.1 Introduction 2.2 State of the Art in the Preparation of Designer Nanomaterials for the Production of Energy and Chemicals 2.2.1 Preparation of Nanomaterials; 2.2.1.1 Physical Routes; 2.2.1.2 Chemical Routes; 2.2.1.3 Physicochemical Routes; 2.2.2 Production of Energy and Chemicals: the Biorefinery Concept; 2.2.2.1 Energy; 2.2.2.2 Catalysis; 2.2.2.3 Other Applications; 2.3 Highlights of Own Research; 2.3.1 Sustainable Preparation of SMNP and Catalytic Activities in the Production of Fine Chemicals; 2.3.1.1 Supported Metallic Nanoparticles: Preparation and Catalytic Activities 2.3.1.2 Supported Metal Oxide Nanoparticles: Preparation and Catalytic Activities 2.3.1.3 Other Related Nanomaterials; 2.3.2 Preparation of Designer Nanomaterials for the Production of Energy; 2.3.2.1 Biodiesel Preparation Using Metal Oxide Nanoparticles; 2.3.2.2 Fuels Prepared via Thermochemical Processes; 2.4 Future Prospects; 2.4.1 Future of the Preparation of SMNPs; 2.4.2 Applications of SMNPs for the Future; 2.4.2.1 Fuel Cells; 2.4.2.2 Catalysis of Platform Molecules; 2.4.2.3 Environmental Remediation; 2.4.2.4 Advanced NMR Applications; 2.5 Conclusions; Acknowledgments; References 3 Supramolecular Receptors for Fullerenes 3.1 Introduction; 3.2 Classic Receptors for Fullerenes Based on Curved Recognizing Units; 3.3 Receptors for Fullerenes Based on Planar Recognizing Units; 3.4 Concave Receptors for Fullerenes; 3.5 Concave Electroactive Receptors for Fullerenes; 3.6 Conclusions and Future Perspectives; Acknowledgments; References; 4 Click Chemistry: A Quote for Function; 4.1 Introduction; 4.2 New Applications in Materials Synthesis; 4.2.1 Metal Adhesives; 4.2.2 Synthesis and Stabilization of Gels; 4.2.2.1 Strength Enhancement of Nanostructured Organogels 4.2.2.2 Synthesis of Polymer Thermoreversible Gels

Sommario/riassunto

Written by some of the most talented young chemists in Europe, this text covers most of the groundbreaking issues in materials science. It provides an account of the latest research results in European materials chemistry based on a selection of leading young scientists participating in the 2008 European Young Chemists Award competition. The contributions range from nanotechnology to catalysis. In addition, the authors provide a current overview of their field of research and a preview of future directions. For materials scientists, as well as organic and analytical chemists.