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Nota di contenuto	Hydrogel Micro and Nanoparticles; Contents; List of Contributors; Foreword; Preface; 1 Thermally Sensitive Microgels: From Basic Science to Applications; 1.1 Introduction; 1.2 Theoretical Background; 1.2.1 Thermodynamics of Volume Phase Transition; 1.2.2 Internal Motion; 1.2.3 Dynamics of Microgel; 1.2.4 Kinetics Calculation of Reversible Aggregation; 1.3 Basic Physics of Microgels; 1.3.1 Volume Phase Transition; 1.3.2 Internal Motion; 1.3.2.1 Internal Motions in Good Solvent; 1.3.2.2 Internal Motions in and Poor Solvents 1.3.3 Dynamics of Cation-Induced Aggregation of Thermally Sensitive Microgels 1.3.3.1 Salt-Induced Complexation; 1.3.3.2 Complexation Between Microgels and Protein; 1.3.3.3 Aggregation of Spherical Microgels; 1.3.4 Non-Ergodic and Ergodic Phenomena of Physical Crosslinked Gel; 1.4 Applications; 1.5 Conclusions; References; 2 Thermosensitive Core-Shell Microgels: Basic Concepts and Applications; 2.1 Introduction; 2.2 Volume Transition in Single Particles; 2.3 Concentrated Suspensions: 3D Crystallization; 2.4 Particles on Surfaces: 2D Crystallization; 2.5 Concentrated Suspensions:

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2.6 Core-Shell Particles as Carriers for Catalysts 2.6.1 Metal Nanoparticles; 2.6.2 Enzymes; 2.7 Conclusion; References; 3 Core-Shell Particles with a Temperature-Sensitive Shell; 3.1 Introduction; 3.2 Preparation of Core-Shell Particles with a Temperature- Sensitive Shell; 3.2.1 Spontaneous Formation of the Core-Shell Structure via Emulsion Polymerization and Soap-Free Emulsion Polymerization; 3.2.2 Formation of a Temperature-Sensitive Shell by Seeded Polymerization; 3.3 Preparation of Hairy Particles with Temperature-Sensitive Hair 3.3.1 Hairy Particle Formation from Block Copolymer Micelles 3.3.2 Hairy Particle Formation Through In Situ Formation of Surface Active Material; 3.3.3 Hairy Particle Formation Through Hair Growth on Core Particles; 3.3.3.1 Hairy Particle Formation Through Hair Growth on Rigid Core Particles; 3.3.3.2 Hairy Particle Formation Through Hair Growth on Microgels; 3.3.3.3 Graft Polymerization of NIPAM from a CMC Microgel Using the Ceric Ion Redox System; 3.3.4 Hairy Particle Formation Through the Attachment of Hydrophilic Polymer Chains to the Surface of Core Particles (Grafting-to Method)
3.4 Properties, Functions and Applications of Core-Shell Particles with a Temperature-Sensitive Shell 3.4.1 Volume Phase Transition of the Temperature-Sensitive Shell and Accompanying Changes in Physical Properties of the Particles; 3.4.2 Two-Dimensional Assembly of Hairy Particles and Optical Properties; 3.4.3 Other 2D Assembly - Temperature-Sensitive Pickering Emulsion by PNIPAM Hairy Particles; 3.4.4 Fluorescence Resonance Energy Transfer (FRET) Particles Tuned by Temperature; 3.5 Conclusions; References; 4 pH-Responsive Nanogels: Synthesis and Physical Properties; 4.1 Introduction
4.2 Preparation Techniques for pH-Responsive Nanogels

Sommario/riassunto

The book provides experienced as well as young researchers with a topical view of the vibrant field of soft nanotechnology. In addition to elucidating the underlying concepts and principles that drive continued innovation, major parts of each chapter are devoted to detailed discussions of potential and already realized applications of micro- and nanogel- based materials. Examples of the diverse areas impacted by these materials are biocompatible coatings for implants, films for controlled drug release, self-healing soft materials and responsive hydrogels that react to varying pH conditions,