

1. Record Nr.	UNINA9910143713803321
Autore	Hamley Ian W
Titolo	Block copolymers in solution [[electronic resource]] : fundamentals and applications / / Ian Hamley
Pubbl/distr/stampa	Chichester, England ; ; Hoboken, NJ, : Wiley, c2005
ISBN	0-470-01698-1 1-280-28749-7 9786610287499 0-470-01697-3
Descrizione fisica	1 online resource (302 p.)
Disciplina	547.84 547/.84 668.9
Soggetti	Block copolymers Electronic books.
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references (p. 276-283) and index.
Nota di contenuto	Cover; Contents; Preface; 1. Introduction; References; 2. Neutral Block Copolymers in Dilute Solution; 2.1 Introduction; 2.2 Techniques for Studying Micellization; 2.2.1 Cryo-TEM; 2.2.2 Differential Scanning Calorimetry; 2.2.3 Dynamic Light Scattering; 2.2.4 Ellipsometry; 2.2.5 Fluorescence Probe Experiments; 2.2.6 Nuclear Magnetic Resonance; 2.2.7 Rheology; 2.2.8 Scanning Probe Microscopy; 2.2.9 Small-angle X-ray and Neutron Scattering; 2.2.10 Static Light Scattering; 2.2.11 Surface Pressure-Area Isotherms; 2.2.12 Surface Tensiometry; 2.2.13 Viscometry; 2.2.14 X-ray and Neutron Reflectivity 2.3 Micellization in PEO-based Block Copolymers 2.4 Micellization in Styrenic Block Copolymers; 2.5 Determination of cmc; 2.6 Thermodynamics of Micellization; 2.6.1 Chain Length Dependence of Micellization; 2.6.2 Effect of Architecture; 2.6.3 Effect of Solvents and Salts on Micellization; 2.7 Micellization and Micelle Dimensions: Theory and Simulation; 2.7.1 Scaling Models; 2.7.2 The Brush Model; 2.7.3 The Self-consistent Mean Field Theory; 2.7.4 The Model of Nagarajan and Ganesh; 2.7.5 Computer Simulations; 2.7.6 Theory: ABC Triblock

Micelles

2.8 Micelle Dimensions: Comparison Between Experiment and Theory
2.9 Interaction between Micelles; 2.10 Dynamics of Micellization; 2.11 Dynamic Modes; 2.12 Specific Types of Micelles; 2.12.1 Micelles from Telechelics; 2.12.2 Micelles from ABC Triblocks; 2.12.3 Micelles from Rod-Coil Copolymers; 2.12.4 Cross-linked Micelles; 2.12.5 Janus Micelles; 2.12.6 Nonspherical Micelles; 2.12.7 Micelles Formed due to Specific Interactions; 2.13 Micellization in Mixed Solvents; 2.14 Mixed Micelles; 2.15 Block Copolymer/Surfactant Complexes; 2.16 Complex Morphologies; 2.17 Vesicles
2.18 Crystallization in Micelles
References; 3. Concentrated Solutions; 3.1 Understanding Phase Diagrams; 3.2 Phase Behaviour of PEO-containing Block Copolymers; 3.3 Gelation; 3.3.1 Rheology; 3.3.2 Structure - Packing of Micelles; 3.3.3 Thermodynamics of Gelation and Micellization in Concentrated Solution; 3.3.4 Effect of Added Homopolymer, Salt or Surfactant; 3.3.5 Influence of Architecture; 3.4 Order-Disorder Phase Transition; 3.5 Order-Order Phase Transitions; 3.5.1 Structural Aspects; 3.5.2 Ordering Kinetics; 3.6 Domain Spacing Scaling, and Solvent Distribution Profiles
3.7 Semidilute Block Copolymer Solution Theory
3.8 Theoretical Understanding of Phase Diagrams; 3.9 Flow Alignment; 3.9.1 Lamellar Phase; 3.9.2 Hexagonal Phase; 3.9.3 Cubic Micellar Phases; 3.10 Dynamics; 3.10.1 Dynamic Modes; 3.10.2 Dynamics of Gelation; References; 4. Polyelectrolyte Block Copolymers; 4.1 Micellization; 4.1.1 General Remarks; 4.1.2 Micellization in Block Copolymers Containing Anionic Blocks; 4.1.3 Micellization in Block Copolymers Containing Cationic Blocks; 4.1.4 Micellization of Polyampholyte Block Copolymers; 4.1.5 Micellization of Polyelectrolyte-containing ABC triblocks
4.1.6 Micellization of Block Copolymers Containing Grafted Polyelectrolytes

Sommario/riassunto

This unique text discusses the solution self-assembly of block copolymers and covers all aspects from basic physical chemistry to applications in soft nanotechnology. Recent advances have enabled the preparation of new materials with novel self-assembling structures, functionality and responsiveness and there have also been concomitant advances in theory and modelling. The present text covers the principles of self-assembly in both dilute and concentrated solution, for example micellization and mesophase formation, etc., in chapters 2 and 3 respectively. Chapter 4 covers polyelectrolyte
