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Nota di contenuto	PRINCIPLES AND APPLICATIONS OF EMULSION POLYMERIZATION; CONTENTS; Preface; 1 Introduction; 1.1 Free Radical Polymerization; 1.1.1 Free Radical Polymerization Mechanisms; 1.1.2 Free Radical Polymerization Kinetics; 1.2 Emulsion Polymerization; 1.2.1 Conventional Emulsion Polymerization; 1.2.2 Emulsion Polymerization Processes; 1.2.3 Miniemulsion Polymerization; 1.2.4 Microemulsion Polymerization; 1.2.5 Inverse Emulsion Polymerization; 1.3 Colloidal Stability; 1.3.1 A Critical but Often Ignored Issue; 1.3.2 Electrostatic Interactions; 1.3.3 Steric Interactions; 1.3.4 Mechanical Stability 1.4 Some Performance Properties for Industrial Applications1.4.1 Rheology; 1.4.2 Film Formation; References; 2 Interfacial Phenomena; 2.1 Thermodynamic Consideration; 2.1.1 Emulsification of Oil in Water; 2.1.2 Interfaces; 2.1.3 Surfactant Molecules Adsorbed at an Interface; 2.2 Surfactants; 2.2.1 Critical Micelle Concentration (CMC); 2.2.2 Hydrophile-Lipophile Balance (HLB); 2.2.3 Solubility Parameter; 2.3 Colloidal Stability; 2.3.1 Van der Waals Forces; 2.3.2 Electrostatic Interactions; 2.3.3 Steric Interactions; 2.3.4 Kinetics of Flocculation; References; 3 Particle Nucleation Mechanisms

3.1 Micellar Nucleation 3.1.1 Harkins-Smith-Ewart Theory; 3.1.2 Competitive Absorption of Free Radicals by Micelles and Particle Nuclei; 3.2 Homogeneous Nucleation; 3.2.1 Formation of Particle Nuclei in the Continuous Aqueous Phase; 3.2.2 Hansen-Ugelstad-Fitch-Tsai (HUFT) Model; 3.3 Coagulative Nucleation; 3.3.1 General Features of Coagulative Nucleation; 3.3.2 Coagulative Nucleation Model Development; 3.4 Mixed Mode of Particle Nucleation Mechanisms; 3.5 Surfactant-Free Emulsion Polymerization; 3.6 Experimental Work on Particle Nucleation; 3.6.1 A Dilemma about Particle Nucleation Mechanisms 3.6.2 Some Representative Experimental Data of Particle Nucleation 3.6.3 Some Potential Techniques for Studying Particle Nucleation; 3.6.4 Effects of Surfactant Concentration on Particle Nucleation; 3.7 Nonionic and Mixed Surfactant Systems; 3.7.1 Nonionic Surfactant Systems; 3.7.2 Mixed Anionic and Nonionic Surfactant Systems; References; 4 Emulsion Polymerization Kinetics; 4.1 Emulsion Polymerization Kinetics; 4.1.1 Smith-Ewart Theory; 4.1.2 Pioneering Kinetic Models for Predicting Average Number of Free Radicals per Particle; 4.2 Absorption of Free Radicals by Latex Particles 4.2.1 Collision- and Diffusion-Controlled Models 4.2.2 Propagation-Controlled Model; 4.2.3 Some Controversial Issues; 4.3 Desorption of Free Radicals Out of Latex Particles; 4.3.1 Desorption of Free Radicals in Emulsion Homopolymerization Systems; 4.3.2 Desorption of Free Radicals in Emulsion Copolymerization Systems; 4.3.3 Effect of Interfacial Properties on Desorption of Free Radicals; 4.4 Growth of Latex Particles; 4.4.1 Thermodynamic Consideration; 4.4.2 Concentrations of Comonomers in Emulsion Copolymerization Systems; 4.4.3 Competitive Growth of Latex Particles 4.5 Polymer Molecular Weight

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## Sommario/riassunto

Up-to-date coverage of methods of emulsion polymerization This book provides a comprehensive reference on emulsion polymerization methods, focusing on the fundamental mechanisms and kinetics of each process, as well as how they can be applied to the manufacture of environmentally friendly polymeric materials. Topics covered include: Conventional emulsion polymerization Miniemulsion polymerization Microemulsion polymerization Industrial emulsion polymerization processes (primarily the semibatch and continuous reactions systems) The role of various colloidal

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