Record Nr. UNINA9910814791603321 Autore Lin Y.-H Titolo Polymer viscoelasticity: basics, molecular theories, experiments and simulations / / Yn-Hwang Lin Singapore; ; Hackensack, N.J., : World Scientific, c2011 Pubbl/distr/stampa **ISBN** 1-283-14464-6 9786613144645 981-4313-04-1 Edizione [2nd ed.] Descrizione fisica 1 online resource (350 p.) Disciplina 620.1/9204232 Soggetti Polymers - Viscosity Viscoelasticity Lingua di pubblicazione Inglese **Formato** Materiale a stampa Livello bibliografico Monografia Description based upon print version of record. Note generali Nota di bibliografia Includes bibliographical references and index. Nota di contenuto Contents; Preface; Preface to the Second Edition; 1. Conformation of Polymer Chains; 2. Rubber Elasticity; 3. Polymer Chain Dynamics; 4. Linear Viscoelasticity; 5. Stress and Strain; 6. Molecular Theory of Polymer Viscoelasticity - Elastic Dumbbell Model; 7. Molecular Theory of Polymer Viscoelasticity-The Rouse Model; 8. Molecular Theory of Polymer Viscoelasticity - Entanglement and the Doi-Edwards (Reptation) Model; 9. Molecular Theory of Polymer Viscoelasticity-The Extended Reptation Model; 10. Comparison of the Extended Reptation Theory (ERT) with Experiments 11. ERT vs. Rouse Theory, Concentration Dependence and Onset of Entanglement, and Tube Dilation 12. Molecular Theory of Polymer Viscoelasticity - Nonlinear Relaxation Modulus of Entangled Polymers; 13. Number of Entanglement Strands per Cubed Entanglement Distance, nt; 14. Glass Transition-Related Thermorheological Complexity in Polystyrene Melts: 15. The Basic Mechanism for the Thermorheological Complexity in Polystyrene Melts; 16. Monte Carlo Simulations of Stress Relaxation of Rouse Chains 17. Monte Carlo Simulations of Stress Relaxation of Fraenkel Chains -Linear Viscoelasticity of Entanglement-Free Polymers 18. Monte Carlo

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Sommario/riassunto

This book covers in great detail the Rouse-segment-based molecular theories in polymer viscoelasticity - the Rouse theory and the extended reptation theory (based on the framework of the Doi-Edwards theory) - that have been shown to explain experimental results in a consistently quantitative way. The explanation for the 3.4 power law of viscosity, quantitative line-shape analyses of viscoelastic responses and agreements between different sorts of viscoelastic responses, the consistency between the viscoelasticity and diffusion results, the clarification of the onset of entangelement,