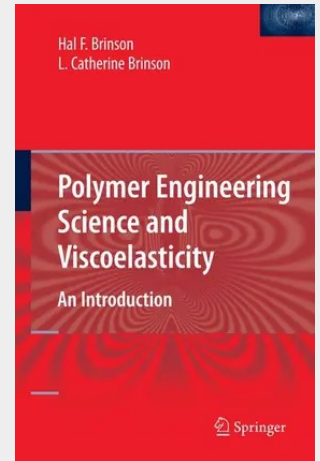


Polymer Engineering Science and Viscoelasticity

An Introduction

A mechanics perspective on the mathematics of viscoelasticity and a materials view of the physical mechanisms behind the polymer deformation processes, are provided by this book. The book fills a critical niche. Clearly written and well-organized, the volume includes an introduction to and mathematical description of the basic materials science of polymers, time-temperature-frequency dependence, and unique deformation mechanisms of polymers.

Polymer Engineering Science and Viscoelasticity: An Introduction provides a unified mechanics and materials perspective on polymers: both the mathematics of viscoelasticity theory, as well as the physical mechanisms behind polymer deformation processes. Written for advanced seniors seeking graduate level courses, first and second year graduate students and practicing engineers, this volume describes the relationship between mechanical properties and the basic molecular structure and mechanisms associated with the performance of structures made from polymer based materials. Clearly written in an organized manner, readers need only basic knowledge of solid mechanics and materials science in order to use this reference successfully. Introductory material on fundamental mechanics is included to provide a continuous baseline for readers from all disciplines. Introductory material on the chemical and molecular basis of polymers is also included, which is essential to the understanding of the thermomechanical response. This self-contained text covers the viscoelastic characterization of polymers including constitutive modeling, experimental methods, thermal response and stress and failure analysis. Example problems are provided within the text as well as at the close of each chapter. Polymer Engineering Science and Viscoelasticity: An Introduction provides an excellent overview suited to cross-disciplinary engineers and scientists who need to understand the basic background of polymeric behavior to rigorous mechanics approaches to the design of structures made with polymer based materials.



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