

HIGH  
POLYMERS  
VOL. VI

# MECHANICAL BEHAVIOR OF HIGH POLYMERS

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The remarkable range of mechanical properties exhibited by high polymers permits them to be used as "rubbers," plastics, textile fibers, films, etc. A systematic treatment of these properties must therefore take a vital place in the High Polymer series. The author attempts to uncover the fundamental principles underlying the mechanical behavior of polymeric structures and to show how this behavior is correlated with the molecular structures involved. This analysis is made on two levels—a phenomenological description and a molecular interpretation. In this book polymer structures are classified and treated as amorphous linear, cross-linked, and crystalline polymers, and polymers admixed with components of low molecular weight. Much original material not previously published is included.

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# Mechanical Behavior Of High Polymers

**T. Alfrey Junior**



## **Mechanical Behavior Of High Polymers:**

**Mechanical Behavior of High Polymers, MECHANICAL BEHAVIOR OF HIGH POLYMERS, 2ND ED.** Turner Alfrey, 1968-01-15     Mechanical Behavior of High Polymers Turner Alfrey (jr.), 1965     *Mechanical Behavior of High Polymers* T. Alfrey Junior, 1948 The plastoelastic behavior of amorphous linear high polymers Three dimensional cross linked polymers Crystallization of high polymers Plasticization and solution systems containing high polymers and materials of low molecular weight Ultimate strength and related properties     Mechanical Behavior of High Polymers Kenneth Lee Pike, 1948

**Mechanical Properties of Polymers** Lawrence E. Nielsen, 1962     **Mechanical Properties of Polymers and Composites, Second Edition** Robert F. Landel, Lawrence E. Nielsen, 1993-12-14 This text now in its second edition offers an up to date expanded treatment of the behaviour of polymers with regard to material variables and test and use conditions It highlights general principles useful empirical rules and practical equations Detailing the specific behaviour of many common polymers the text places emphasis on time and frequency dependence over temperature dependence uses contemporary molecular mechanisms to explain creep stress relaxation constant strain rate responses and crazing provides explicit equations to predict responses supplies a discussion of large deformation multiaxial responses compares statistical and continuum theories on the same data set and updates stress strain behaviour and particulate filled systems     **Mechanical Behavior of Engineering Materials** Y.M. Haddad, 2000-08-31 This monograph consists of two volumes and provides a unified comprehensive presentation of the important topics pertaining to the understanding and determination of the mechanical behaviour of engineering materials under different regimes of loading The large subject area is separated into eighteen chapters and four appendices all self contained which give a complete picture and allow a thorough understanding of the current status and future direction of individual topics Volume I contains eight chapters and three appendices and concerns itself with the basic concepts pertaining to the entire monograph together with the response behaviour of engineering materials under static and quasi static loading Thus Volume I is dedicated to the introduction the basic concepts and principles of the mechanical response of engineering materials together with the relevant analysis of elastic elastic plastic and viscoelastic behaviour Volume II consists of ten chapters and one appendix and concerns itself with the mechanical behaviour of various classes of materials under dynamic loading together with the effects of local and microstructural phenomena on the response behaviour of the material Volume II also contains selected topics concerning intelligent material systems and pattern recognition and classification methodology for the characterization of material response states The monograph contains a large number of illustrations numerical examples and solved problems The majority of chapters also contain a large number of review problems to challenge the reader The monograph can be used as a textbook in science and engineering for third and fourth undergraduate levels as well as for the graduate levels It is also a definitive reference work for scientists and engineers involved in the production processing and applications of engineering

materials as well as for other professionals who are involved in the engineering design process     An Introduction to the Mechanical Properties of Solid Polymers I. M. Ward,J. Sweeney,2005-08-19 Provides a comprehensive introduction to the mechanical behaviour of solid polymers Extensively revised and updated throughout the second edition now includes new material on mechanical relaxations and anisotropy composites modelling non linear viscoelasticity yield behaviour and fracture of tough polymers The accessible approach of the book has been retained with each chapter designed to be self contained and the theory and applications of the subject carefully introduced where appropriate The latest developments in the field are included alongside worked examples mathematical appendices and an extensive reference Fully revised and updated throughout to include all the latest developments in the field Worked examples at the end of the chapter An invaluable resource for students of materials science chemistry physics or engineering studying polymer science

**Mechanical Properties of Solid Polymers** Ian M. Ward,John Sweeney,2012-12-17 Providing an updated and comprehensive account of the properties of solid polymers the book covers all aspects of mechanical behaviour This includes finite elastic behavior linear viscoelasticity and mechanical relaxations mechanical anisotropy non linear viscoelasticity yield behavior and fracture New to this edition is coverage of polymer nanocomposites and molecular interpretations of yield e g Bowden Young and Argon The book begins by focusing on the structure of polymers including their chemical composition and physical structure It goes on to discuss the mechanical properties and behaviour of polymers the statistical molecular theories of the rubber like state and describes aspects of linear viscoelastic behaviour its measurement and experimental studies Later chapters cover composites and experimental behaviour relaxation transitions stress and yielding The book concludes with a discussion of breaking phenomena     **The Effect of Radiation on the Mechanical Properties of**

**Polymers** R. K. Traeger,1964     Handbook of Viscoelastic Vibration Damping David I. G. Jones,2001-07-10 Describing at a fundamental level the improvements in knowledge of viscoelastic damping which have occurred in recent years this text will allow engineers to increase their understanding of basic principles and hence improve their appreciation of the potential damping applications of viscoelastic materials Features include Emphasis on step by step explanations and illustrations Simple approaches for practical structural applications This text is a wide ranging and valuable reference resource for anyone involved in vibration control including vibration control analysts researchers practitioners and designers in industry and consultancy as well as graduate students in mechanical aeronautical and marine engineering     Mechanical Behavior of Materials: Special vol. Commemoration number of the 1971 Kyoto ICM ,1972     **Mechanical Tribology** George E.

Totten,Hong Liang,2004-04-22 Studying the morphology defects and wear behavior of a variety of material surfaces Mechanical Tribology examines popular and emerging surface characterization techniques for assessment of the physical mechanical and chemical properties of various modified surfaces thin films and coatings Its chapters explore a wide range of tribology     Army Research Task Summary ,1961     **Scientific and Technical Aerospace Reports** ,1973 Lists citations

with abstracts for aerospace related reports obtained from world wide sources and announces documents that have recently been entered into the NASA Scientific and Technical Information Database     **Army Research Task Summary** United States. Army Research Office,1961     **Army Research Office, Fiscal Year 1961, Army Research Task Summary** United States Department of the Army,1961     Army Research Task Summary: Chemistry United States. Army Research Office,1961     **U.S. Government Research Reports** ,1962     *NBS Special Publication* ,1968

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