VOLUME 2

DYNAMICS OF POLYMERIC LIQUIDS

KINETIC THEORY

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Dynamics Of Polymeric Liquids Volume 2 Kinetic Theory

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Dynamics Of Polymeric Liquids Volume 2 Kinetic Theory:

Dynamics of Polymeric Liquids, Kinetic Theory R. Byron Bird,Charles F. Curtiss,Robert C. Armstrong,Ole Hassager,1987-05-04 **Dynamics of Polymeric Liquids - Volume 2 : Kinetic Theory** Bird RB.,1987 *Dynamics of Polymeric Liquids, Volume 2* R. Byron Bird,Charles F. Curtiss,Robert C. Armstrong,Ole Hassager,1987-05-04 This two volume work is detailed enough to serve as a text and comprehensive enough to stand as a reference Volume 1 Fluid Mechanics summarizes the key experiments that show how polymeric fluids differ from structurally simple fluids then presents in rough historical order various methods for solving polymer fluid dynamics problems Volume 2 Kinetic Theory uses molecular models and the methods of statistical mechanics to obtain relations between bulk flow behavior and polymer structure Includes end of chapter problems and extensive appendixes Dynamics of Polymeric Liquids, Volume 1 R. Byron Bird,1987-05-27 This revision of an introductory text examines Newtonian liquids and polymer fluid mechanics It begins with a review of the main ideas of fluid dynamics as well as key points of Newtonian fluids Dynamics of Polymeric Liquids, 2 Volume Set R. Byron Bird,Charles F. Curtiss,Robert C. Armstrong,Ole Hassager,1991-01-16 This two volume work is detailed enough to serve as a text and comprehensive enough to stand as a reference Volume 1 Fluid Mechanics summarizes the key experiments that show how polymeric fluids differ from structurally simple fluids then presents in rough historical order various methods for solving polymer fluid dynamics problems Volume 2 Kinetic Theory uses molecular models and the methods of statistical mechanics to obtain relations between bulk flow behavior and polymer structure Includes end of chapter problems and extensive appendixes *Dynamics of Polymeric Liquids: Bird, R. B., et al. Kinetic theory* Robert Byron Bird,1977 **The Mesoscopic Theory of Polymer Dynamics** Vladimir N. Pokrovskii,2009-12-16 The theory presented in this book explains in a consistent manner all dynamics effects observed in very concentrated solutions and melts of linear polymers from a macromolecular point of view The presentation is compact and self contained **The Mesoscopic Theory of Polymer Dynamics** Vladimir Nikolaevich Pokrovskiĭ,2000 Our brutal century of atom bombs and spaceships can also be called the century ofpolymers In any case the broad spreading ofsynthetic polymer materials is one of thesigns of our time A look at the various aspects of our life is enough to convince us that polymeric materials textiles pl tics rubbers are as widely spread and important in our life as are other materials metals and non metals derived from small molecules Polymers have entered the life of the twentieth century as irreplaceable construction materials Polymers differ from other substances by the size of their molecules which appropriately enough are referred to as macromolecules since they consist of thousands or tens of thousands of atoms molecular weight up to 4 6 10 ormore andhave a macroscopic rectilinear length upto 10 cm The atoms ofa macromolecule are firmly held together by valence bonds fo ing a single entity In polymeric substances the weaker van der Waals forces have an effect on the components of the macromolecules which form the system The structure of polymeric systems is more complicated than that oflow molecular solids or liquids but there are some common features the atoms

within a given macromolecule are ordered but the centres ofmass of the individual macromolecules and parts of them are distributed randomly Remarkably the mechanical response of polymeric systems combines the elasticity of a solid with the fluidity of a liquid **Stochastic Processes in Polymeric Fluids** Hans C. Öttinger,2012-12-06 A SPECTER is haunting the scientific world the specter of com puters All the powers of traditional science have entered into a holy alliance to exorcise this specter puristic theoreticians and tradition alistic experimentalists editors and referees of prestigious journals philosophers of science and mathematicians Where is a pioneering computer simulation that has not been decried as unreliable by its opponents in power The Computer Manifesto As a result of the enormous progress in computer technology made during the last few decades computer simulations have become a very powerful and widely applicable tool in science and engineering The main purpose of this book is a comprehensive description of the background and possibilities for the application of computer simulation techniques in polymer fluid dynamics Mod eling and understanding the flow behavior of polymeric liquids on the kinetic theory level is not merely a great intellectual challenge but rather a matter of immense practical importance for example in connection with plastics manu facture processing of foods and movement of biological fluids The classical computer simulation technique for static problems in statis tical mechanics is the Monte Carlo method developed in the early 1950s The name of this method underlines how unusual and strange the idea of using ran dom numbers in the exact sciences is at first glance However the Monte Carlo method is a rigorous and efficient means for evaluating moments and static spa tial correlation functions for given probability distributions **Flows in Polymers, Reinforced Polymers and Composites** Christophe Binetruy,Francisco Chinesta,Roland Keunings,2015-03-30 This book gives a detailed and practical introduction to complex flows of polymers and reinforced polymers as well as the flow of simple fluids in complex microstructures Over the last decades an increasing number of functional and structural parts made so far with metals has been progressively reengineered by replacing metallic materials by polymers reinforced polymers and composites The motivation for this substitution may be the weight reduction the simpler cheaper or faster forming process or the ability to exploit additional functionalities The present Brief surveys modern developments related to the multi scale modeling and simulation of polymers reinforced polymers that involve a flowing microstructure and continuous fiber reinforced composites wherein the fluid flows inside a nearly stationary multi scale microstructure These developments concern both multi scale modeling defining bridges between the micro and macro scales with special emphasis on the mesoscopic scale at which kinetic theory descriptions apply and advanced simulation techniques able to address efficiently the ever more complex and detailed models defined at different scales This book is addressed to students Master and doctoral levels researchers and professionals interested in computational rheology and material forming processes involving polymers reinforced polymers and composites It provides a unique coverage of the state of the art in these multi disciplinary fields Dynamics of Polymeric Liquids Robert Byron Bird,1977 **Transport Phenomena** R. Byron Bird,Warren E.

Stewart,Edwin N. Lightfoot,2006-12-11 The market leading transport phenomena text has been revised Authors Bird Stewart and Lightfoot have revised Transport Phenomena to include deeper and more extensive coverage of heat transfer enlarged discussion of dimensional analysis a new chapter on flow of polymers systematic discussions of convective momentum energy and mass transport and transport in two phase systems If this is your first look at Transport Phenomena you ll quickly learn that its balanced introduction to the subject of transport phenomena is the foundation of its long standing success About the Revised 2nd Edition Since the appearance of the second edition in 2002 the authors and numerous readers have found a number of errors some major and some minor In the Revised 2nd Edition the authors have endeavored to correct these errors A new ISBN has been assigned to the Revised 2nd Edition in order to more easily identify the most correct version For Bird s corrigenda please click here and see Transport Phenomena in the Books section *Dynamics of Polymeric Liquids: Bird, R. B., Armstrong, R. C., Hassager, O. Fluid mechanics* Robert Byron Bird,1977 **Fundamentals of Fluid Mechanics** Joseph A. Schetz,Allen E. Fuhs,1999 Basic fluid dynamic theory and applications in a single authoritative reference The growing capabilities of computational fluid dynamics and the development of laser velocimeters and other new instrumentation have made a thorough understanding of classic fluid theory and laws more critical today than ever before Fundamentals of Fluid Mechanics is a vital repository of essential information on this crucial subject It brings together the contributions of recognized experts from around the world to cover all of the concepts of classical fluid mechanics from the basic properties of liquids through thermodynamics flow theory and gas dynamics With answers for the practicing engineer and real world insights for the student it includes applications from the mechanical civil aerospace chemical and other fields Whether used as a refresher or for first time learning Fundamentals of Fluid Mechanics is an important new asset for engineers and students in many different disciplines **Operability of Extensional Rheometry by Stagnation, Squeezing, and Fiber-drawing Flows** Robert Bruce Secor,1988 **Encyclopedia of Fluid Mechanics: Flow phenomena and measurement** ,1986 *Deformation of Fluid Microstructure in General Homogeneous Flows* Matthias Ulrich Nollert,1987 **High Pressure Rheology for Quantitative Elastohydrodynamics** Scott S. Bair,2007-04-13 Computational elastohydrodynamics a part of tribology has existed happily enough for about fifty years without the use of accurate models for the rheology of the liquids used as lubricants For low molecular weight liquids such as low viscosity mineral oils it has been possible to calculate with precision the film thickness in a concentrated contact provided that the pressure and temperature are relatively low even when the pressure variation of viscosity is not accurately modelled in detail Other successes have been more qualitative in nature using effective properties which come from the fitting of parameters used in calculations to experimental measurements of the contact behaviour friction or film thickness High Pressure Rheology for Quantitative Elastohydrodynamics is intended to provide a sufficiently accurate framework for the rheology of liquids at elevated pressure that it may be possible for computational elastohydrodynamics to discover the relationships

between the behaviour of a lubricated concentrated contact and the measurable properties of the liquid lubricant The required high pressure measurement techniques are revealed in detail and data are presented for chemically well defined liquids that may be used as quantitative reference materials Presents the property relations required for a quantitative calculation of the tribological behaviour of lubricated concentrated contacts Details of high pressure experimental techniques Complete description of the pressure and temperature dependence of viscosity for high pressures Some little known limitations on EHL modelling A Theory of Chainlike Polymers Lewis E. Wedgewood,1988 Annual Review of Physical Chemistry Gerhard Krohn Rollefson,1977-10 Provides abstracts and review articles on topics in physical chemistry

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