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Constitutive Equations For Polymer Melts

Constitutive equations for polymer melts and solutions

(PDF) Constitutive equations for polymer melts and ...

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Constitutive Equations for Polymer Melts and Solutions ...

The constitutive equations derived by Doi and Edwards and by Curtis and Bird from kinetic theory models are shown to possess a potential function U, which completely determines the strain-dependent memory fading.An exact expression for U is found, together with a good approximation expressed as a simple combination of the strain invariants. This result is compared with empirical results for ...

Constitutive equations for polymer melts predicted by the ...

Constitutive Equations for Polymer Melts and Solutions presents a description of important constitutive equations for stress and birefringence in polymer melts, as well as in dilute and concentrated solutions of flexible and rigid polymers, and in liquid crystalline materials.

Constitutive Equations for Polymer Melts and Solutions ...

Constitutive Equations for Polymer Melts and Solutions presents a description of important constitutive equations for stress and birefringence in polymer melts, as well as in dilute and concentrated solutions of flexible and rigid polymers, and in liquid crystalline materials. The book serves as an introduction and guide to constitutive equations, and to molecular and phenomenological theories of polymer motion and flow.

Constitutive Equations for Polymer Melts and Solutions ...
Constitutive Equations for Polymer Melts and Solutions presents a description of important constitutive equations for stress and birefringence in polymer melts, as well as in dilute and concentrated solutions of flexible and rigid polymers, and in liquid crystalline materials.

Constitutive Equations for Polymer Melts and Solutions ...
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Constitutive equations for polymer melts and solutions ...
The aim of this short paper is to obtain a simple constitutive equation for fast flows of entangled polymer melts from our full theory . This kind of simple “one-mode” equation is required for simulations of complex flows, see for example [9] , [10] , where

only the rheological response is required without needing information about ...

Simple constitutive equation for linear polymer melts ...
title = "Differential constitutive equations for polymer melts : the extended Pom-Pom model", abstract = "The Pom-Pom model, recently introduced by Mcleish andLarson [J.Rheol., 42(1), 1998], is a breakthrough in the fieldof visco-elastic constitutive equations.

Differential constitutive equations for polymer melts ...
KEY WORDS: polymer melts, polymer solutions, viscoelasticity, rheology, stress tensor INTRODUCTION This review addresses the origins, uses, and evaluation of constitutive equations for the stress tensor of polymeric liquids. The continuum aspects of the subject up to about 1986 were summarized by Bird et al (1987a),

Constitutive Equations for Polymeric Liquids

Rheological equations of state are of great importance for characterization of polymer melts and for simulation of polymer processing. This concise review considers tube model based constitutive equations developed in the last 40 years since the original publication of Doi and Edwards in 1978. The emphasis is on the concepts, assumptions, and material parameters introduced to model nonlinear viscoelasticity of polydisperse linear and long-chain branched polymer melts.

Review on tube model based constitutive equations for ...

A factorable non-linear viscoelasticity model, the Wagner integral model, derived from the K-BKZ constitutive equation, was used in order to predict the non-linear rheological response of the above-mentioned lubricating grease under shear.

Modeling of the Non-Linear Rheological Behavior of a ...

Abstract. We review constitutive modeling of solutions and melts of linear polymers, focusing on changes in rheological behavior in shear and extensional flow as the concentration increases from unentangled dilute, to entangled, to dense melt. The rheological changes are captured by constitutive equations, prototypes of which are the FENE-P model for unentangled solutions and the DEMG model for entangled solutions and melts.

Modeling the Rheology of Polymer Melts and Solutions ...

Constitutive equations for polymer melts and solutions (DLC) 87021807 (OCoLC)16356523: Material Type: Document, Internet resource: Document Type: Internet Resource, Computer File: All Authors / Contributors: Ronald G Larson. Find more information about: ISBN: 9781483162867 1483162869:

Constitutive equations for polymer melts and solutions ...

In deriving a constitutive equation from a molecular model of polymers in concentrated solutions and melts, Doi and Edwards used a mathematical approximation, the “independent alignment approximation,” which has recently been shown to produce significant error in the particular case of stress relaxation following a double-step strain in opposite direction.

A constitutive equation derived from the model of doi and ...

Barnes, H.A.; Roberts, G.P. A simple empirical model describing the steady-state shear and extensional viscosities of polymer melts. J. Non-Newton. Fluid Mech. 1992, 44, 113–126. [Google Scholar] Zatloukal, M. Differential viscoelastic constitutive equations for polymer melts in steady shear and elongational flows. J. Non-Newton.

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The experimental data of Matsumiya et al. [Macromolecules 51, 9710–9729 (2018)] for start-up and the steady-state elongational flow of monodisperse unentangled polystyrene PS27k and poly(p-tert-butylstyrene) PtBS53k melts are analyzed based on the relaxation spectrum of the Rouse model and a single integral constitutive equation.As shown by Lodge and Wu [Rheol.

Modeling nonlinear rheology of unentangled polymer melts ...

His works include the constitutive equations for polymer melts, the application of rheology to the processing of polymers, and structure-property relationships for polymers. The focus of his work on rheology is the field of non-linear shear and elongational behavior of polymer melts and effects of polydispersity, branching and blending on melt behavior.

Manfred Wagner - Wikipedia

Giesekus H (1982) A simple constitutive equation for polymer fluids based on the concept of deformation-dependent tensorial mobility. J Non-Newtonian Fluid Mech 11:69–109 Google Scholar 11. Larson RG (1984) A constitutive equation for polymer melts based on partially extending strand convection.