

Thomas Mezger

The Rheology Handbook by Thomas Mezger is published by Vincentz with the aim to close the gap between specialized technical literature on university level and simple brochures with small depth. It is limited to the necessary theoretical bases and gives beyond that a founded, practical guidance to perform various tests for material characterization. It emphasizes a clear description of current measuring methods in the area of the quality control, production and application technology, material research and development.

After having read the book, the reader should be able to independently perform tests with rotational and oscillator rheometers and to interpret the results correctly. The rheology handbook contains a multiplicity of illustrative examples for experimental protocols and helps to interpret the data. It is a useful reference for the characterization of polymers, adhesives, lacquers, pigments, food, cosmetics and detergents. The book is based on seminar booklets used by Physica Messtechnik in their training courses. It is suitable for readers without prior knowledge

in rheology and also for those who want to update their expertise.

After a short introduction the book begins with a description of the flow behavior of viscous materials. First the fundamental parameters are defined and afterwards phenomena based on structural changes such as shear thinning, shear thickening, thixotropy, rheopexy and yield stress are described. The fitting of flow curves with theoretical models is explained as well. Chapter 3 deals with the description of rotational tests and describes in detail shear stress and shear rate controlled experiments. Time-dependent flow curves are

shown and discussed. In chapter 4 the strain response of elastic materials is introduced.

The following sections focus on the description of viscoelastic behavior. Among other things Maxwell and Voigt Kelvin model as well as the Weissenberg effect and normal stresses are introduced. Creep tests of viscoelastic solids and liquids are compared and retardation time spectra are described. Chapters 7 and 8 describe relaxation and oscillatory tests and are divided into an introduction with fundamental definitions, investigational procedures and data analysis. Amplitude and frequency sweeps are presented for polymers of different molecular architecture as well as for dispersions and gels. A description of time and temperature-dependent tests follows.

In chapter 9 different measuring systems for rotational rheometers are introduced. Here, the pros and cons of different geometries are compiled very clearly. The following section describes different types of instruments e.g. flow cups, capillary and falling-ball viscometers as well as rotational and oscillatory rheometers. Chapter 11 provides a historical overview on the development of rheology.

In summary "The Rheology Handbook" can be recommended for those who have no or little prior knowledge in rheology. The book excellently fills the gap between highly specialized technical literature and introductory articles. It is well structured and of high use for the practice oriented user.

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Bibliography:

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