

Book Reviews

Strength and Failure of Visco-elastic Materials

G. M. BARTENEV and YU. S. ZUYEV. Pergamon: Oxford, 1968. 5½ in. × 9 in.
xi+419 pp. 140s

THIS book is a translation of the Russian edition published in 1964. The title is somewhat misleading in that the book deals primarily with elastomeric materials. However, in order to give an up-to-date presentation the opening chapters cover the general theory of the strength of solids, the deformation and strength of polymers and the mechanism of failure of polymers. The remaining chapters refer essentially to rubbers and include chapters on the time dependence of the strength of rubbers, dependence of strength on strain rate and type of filler, strength and fatigue under cyclic loadings, tearing of rubbers. The last five chapters deal with various aspects of the failure of rubbers in aggressive environments.

The book describes the problems and summarizes the results of numerous investigations on the strength, durability and mechanism of failure of rubbers and related polymers. The theories of the strength of polymers and mechanisms of failure are discussed in detail. One of the most valuable features of the book is the extensive summaries of recent work in Russian laboratories much of which has not been previously available. As a whole this monograph is a readable and instructive account of the physical and physicochemical aspects of the strength problem of polymeric materials and will be particularly useful to the rubber chemist and technologist.

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The Stereochemistry of Macromolecules, Volume III

Edited by A. D. KETLEY. Arnold: London; Marcel Dekker, New York, 1968.
xiii+460 pp. 6 in. × 9 in. 195s

THIS is the third and final volume in this series and contains a very mixed collection of contributions. The first chapter by Professor CORRADINI on chain conformation and crystallinity in stereoregular polymers is excellently written and well worth reading. This is followed by chapters on nuclear magnetic resonance and infra-red studies on stereoregular polymers which although not of the same high quality as Chapter 1 are good enough in themselves. In the middle of the volume the subject matter changes dramatically and the reader finds himself confronted with topics such as transfer of genetic information in biological systems, and automatic theories of heredity. Presumably the Editor intended to draw the readers' attention to the similarity between phenomena associated with naturally occurring polymers and synthetic stereoregular materials. Unfortunately the presentation of the book as a series of chapters written by individual experts, without any attempt to bring such diverse topics together, leads to a disjointed narrative.

A further criticism is that the sixty page article on the degradation of stereoregular polymers concludes with the statement 'that the main difference in results obtained for the degradation of atactic and corresponding stereoregular polymers are, in fact, not due to stereoregularity'. If this is the true situation why write sixty pages of material? A similar objection can be levelled at the articles on the properties of stereoregular polymers in solution. Here again the experimental findings show that the differences between the latter polymers and their atactic counterparts are small, probably due to imperfection in the polymer chain.

The chapter on solid state behaviour was interesting but could have been made longer so as to include some discussion of the crystallization and melting of stereoregular polymers.

In conclusion there are several features to this book which make it worth having, but the choice of topics by the Editor makes it a rather disjointed collection.

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