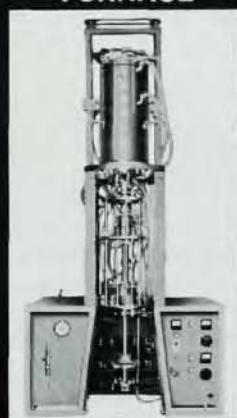


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van Vliet and Fassett on fluctuations due to electronic transitions and transport in solids. Several other papers in this collection deal with fluctuations in magnetic and dielectric solids, ferromagnetic solids, solid-state plasmas, nonlinear systems, and the fluctuations of hot electrons.

Although one could wish for more material describing the experimental manifestations of solid-state noise, this book can be highly recommended for those interested in a wide-ranging account of current research in the area.

Configurational Statistics of Polymeric Chains. By M. V. Volkenstein. 562 pp. Interscience, New York, 1963. \$20.00. Reviewed by Herbert Leaderman, National Bureau of Standards.

It is often necessary, in introducing a book or treatise on high polymer physical chemistry or physics, to remind the reader that the foundations of polymer chemistry were established by Staudinger with his demonstration of the existence of the long-chain molecule; the foundations of polymer physical chemistry and physics were established by Kuhn and by Guth and Mark with their treatments of the flexible randomly kinked long-chain molecule in Brownian motion. Because of the relative newness of this field of study, it was possible in the not too distant past for one authority to write a treatise on the whole field of polymer science. With the great expansion of this branch of science, this can no longer be done. Fortunately, in recent years, authorities on various aspects have published valuable treatises covering their specialties; this book belongs to this category.

The rapid recent growth of polymer science has possibly been stimulated by commercial interest in certain aspects. However, polymer science is not to be regarded as a branch of technology or applied science, but a bona fide new aspect of classical physics and physical chemistry. Workers engaged in basic academic research in this field need not feel apologetic, as the author does in his introduction, for the technological applications of his subject. In this field of study, we are continuously witnessing radical changes and even overthrow not only of de-

tails but also of fundamental concepts. In view of the time involved in the preparation of a comprehensive treatise, and the further time-lag when a translation is necessary, it is to be expected that such a treatise will be somewhat out of date even on fundamentals when the book finally appears. This is part of the occupational hazard in treatise writing, which is well understood by the readers and also the writers of such treatises, and so here again the author has no need to apologize for such lacunae.

The central part of the book is concerned with the statistical configuration of the long semiflexible molecule. Starting with the simplest model, the freely jointed zero-thickness chain, the model is progressively refined to include the effect of finite valence angle and restricted rotation. The dimensions of chains containing more complicated repeat units are considered. The physical nature of the model, and the significance of the results of the calculations, are discussed in detail. The conformations of real polymer chains in crystals, and also of some aspects of crystallization in polymers are considered. Using in part these and other theoretical and experimental results, the calculated conformation of real polymer chains is compared with experimental observations.

Introductory material in the front part of the book deals with the chemical structure of some polymeric systems, and the physical chemistry of such systems. The nature of restricted rotation around covalent bonds is discussed. Finally, the polarizability of polymer chains, optical birefringence, and equilibrium elasticity of stretched polymer networks are treated.

The book concludes with a critical discussion of the present status and possible future lines of development of the theory of the configuration of polymer chains as related to the experimentally observed physical properties of polymeric systems. A detailed study of this scholarly work is indispensable to theoretical and experimental workers for information concerning the present status of and previous developments in the theory of the conformation of polymer molecules.