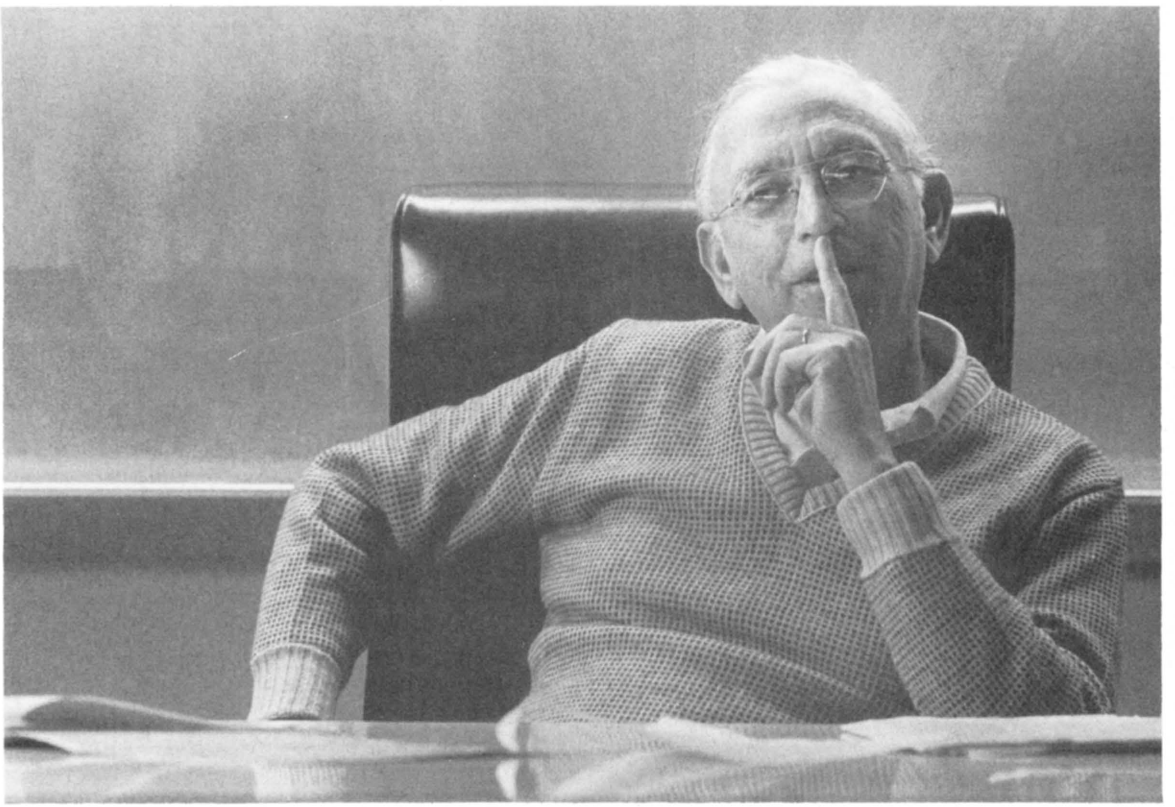

Leo Mandelkern, One of the Pioneers of Polymer Science

During this month of February, Leo Mandelkern will celebrate his 65th birthday. He and his many friends can pause to look back over some of the profound contributions he has made to polymer science in general, and to polymer crystallization in particular. It has, in fact, become virtually impossible to think about crystalline polymers without associating them with Mandelkern and the school of research he started in the early 1950s. His work has thus already spanned four decades. Fortunately for the polymer community around the world, it continues at the same high levels of originality and relevance.

Professor Mandelkern was born in New York City on February 23, 1922, and attended the public schools there. He moved to Cornell University for his undergraduate work, receiving a B.A. degree in chemistry in 1942. After serving with the armed forces during the war years, he returned to Cornell for his graduate studies. He worked there with Frank Long, and received the Ph.D. degree in physical chemistry in 1949. Cornell was then becoming a preeminent center for polymer research, due to the presence of Long, Peter Debye, Paul Flory, and Harold Scheraga. Not surprisingly, Leo decided to remain at Cornell for postdoctoral research with Professor Flory. Thus began a long scientific collaboration and personal friendship that continued until Flory's untimely death in September of 1985.

After 10 years at the National Bureau of Standards, Mandelkern joined the faculty of the Department of Chemistry at Florida State University in 1962, where he now holds the R. O. Lawton Distinguished Professorship. He has also been visiting professor at the University of Miami, University of California at San Francisco, and Cornell University.

Leo has done a great deal of important behind-the-scenes work on a study panel of the National Research Council and on the Education Committee of the ACS Division of Polymer Chemistry. His interest in broadening the range of appreciation for polymers is readily apparent in *An Introduction to Macromolecules* (1972, 1983). He has been a strong advocate of the integration of polymer subjects into the core chemistry curriculum. The fact that macromolecular systems provide excellent illustrations of many fundamental principles of physical chemistry, and do so in a way that excites student interest, has been emphasized. Students who learned their thermodynamics from Leo will fondly(?) recall his strongly disapproving reaction to the automatic assignment of dw to pV work.

The editorial boards of *Macromolecules*, *Journal of the American Chemical Society*, *Journal of Polymer Science*, and *Journal of Mechanochemistry and Cell Motility* have benefited from his service. Leo is also a Fellow of both the American Physical Society and the New York Academy of Sciences. Among the recognitions of his scientific contributions are the Arthur S. Fleming Award (1958), ACS Award in Polymer Chemistry (1975), Mettler Award in Thermal Analysis (1984), and Florida Regional ACS Award (1984).

The major themes of Mandelkern's research have been

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the thermodynamics and kinetics of polymer crystallization, the morphology of the crystalline state, and contractility or mechanochemistry. Of particular importance was his definitive demonstration that crystalline polymers consist of two thermodynamically distinct phases, with the transition between them being of first order. His first book, *Crystallization of Polymers* (1964), is a classic. Leo's interest in the kinetics, as well as thermodynamics, of crystallization gave rise to his important theoretical work on nucleation processes. Parallels and differences with small-molecule systems were clearly pointed out, making this work also of great interest to non-polymer chemists. Interest in the crystallization process led naturally to studies of the morphology of the crystalline state. Mandelkern's detailed investigation of the nature of the crystal–liquid interface, particularly with regard to chain folding, aroused a great deal of interest. Although initially considered controversial, these studies are now regarded as classics and the conclusions widely accepted. Supermolecular structures then became the subjects of Leo's critical studies. The variety of forms achievable in polymeric systems were clearly described, along with the conditions necessary for their development. The amorphous regions were not ignored, and their characterization by NMR relaxation measurements contributed important information on semicrystalline polymers in general. The fascinating dimensional changes or "contractility" exhibited by highly oriented fibers, such as collagen, have also been thoroughly investigated.

It is appropriate to conclude this tribute to Leo Mandelkern with appreciation of his dedication to the education of polymer scientists, to the broader dissemination of polymer science, and to its recognition as an important area in basic physics and chemistry. His many students and collaborators have of course benefited the most directly, through both his tutelage and inspiration. The young scientists who studied in his laboratory know that "Leo the Lion" is very supportive and goes out of his way to help them, even after many years have passed since they left Tallahassee. Leo Mandelkern has thus been one of the notable pioneers of polymer science, and he has greatly enriched this discipline in his own, highly distinctive way. All of his friends, associates, and other admirers wish him continued good health and look forward to much more of his exemplary science and personal inspiration.

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