Concise Encyclopedia of Polymer Science and Engineering

Jacqueline I. Kroschwitz, Executive Editor
(John Wiley & Sons, New York, 1998)
xxix+1341 pages, $150
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The *Encyclopedia of Polymer Science and Technology* appeared in 18 volumes over the period 1964–1977. A second (revised) edition was published during 1985–1990 under the modified title *Encyclopedia of Polymer Science and Engineering*. In 1990, a concise version appeared in which all of the topics covered in the original massive work were included but in condensed form prepared by professional science writers, and checked by the authors of the basic text. Thus, one million words attempted to cover the essential content of the tenfold greater text in the *Encyclopedia* itself. It is this concise edition which is now re-issued (mid-1998).

The *Encyclopedia* is a sort of *"Britannica" of Polymer Science* in the broadest sense of that term. As a work of reference, every laboratory, workshop, or factory concerned with the synthesis or processing of polymers would dearly like to have it readily available but many would have found the cost (and weight) prohibitive. It is easy to understand, therefore, that the condensed version would have found an eager market. The articles in the *Encyclopedia* were indeed highly authoritative, and both the original and the concise versions are beautifully produced. In the context of 1990, it would have been extremely difficult to launch any adverse criticism of this courageous enterprise.

The problem today is that almost 15 years have passed since the original text was prepared. The most recent references date from the 1980s and many topics that have become important in the last decade are either absent or so superficially covered as to be virtually absent. The balance of topics can seem very strange, in consequence: 19 pages on stereoregular linear polymers but only two on electrically conducting polymers, for example. Any encyclopedia issued today would include a great deal more on liquid-crystal polymers or lithographic applications, the use of metallocenes or ROMP; but these are naturally missing from a text prepared so long ago.

Overall, this remains a useful addition to any polymer science library and it is excellent value for money at the price (about nine pages for $1). But readers must be aware that the information that they cull from this work of reference reflects the state-of-the-art as it was more than 10 years ago, and that in a discipline that has moved very rapidly during the last decade. In other words, it is wonderful up to a point but any resort to it in the context of present-day polymer science must necessarily be supplemented by perusal of more topical texts. Nevertheless, it is an excellent place to start.

Reviewer: *Aubrey Jenkins is Emeritus Professor of Polymer Science in the School of Chemistry, Physics, and Environmental Science at the University of Sussex, U.K. Jenkins' research interests include polymer chemistry, mechanism of polymerization reactions, and reactivity of radicals.*

Ceramic Microstructures: Control at the Atomic Level

Antoni P. Tomsia and
Andreas M. Glaeser, Editors
(Plenum Press, New York, 1998)
854 pages, $195.00
ISBN 0-306-45817-9

Ceramic Microstructures is the legacy of and a tribute to the research, teachings, and interests of Joseph A. Pask. For more than 50 years, Pask has been and continues to be a driving force in the advancement of ceramic science. He is a pioneer in areas such as wetting and adhesion, experimental determination of phase diagrams, processing science, and promoting relations with researchers in the Far East.

This volume is an attractive collection of papers presented at the fourth Microstructures symposium, a meeting that has been held once every 10 years beginning in 1966. The purpose of the meetings is to discuss and document the state-of-the-art in the science of characterizing, understanding, and controlling the development of the microstructure (and, therefore, the properties) of ceramics and ceramic-based composites. Many of the contributors are Pask's colleagues, students, and friends while others have built upon work that he pioneered.

The book contains a number of very good contributions. As suggested by the title, many chapters include electron micrographs along with sophisticated modeling or analysis of nanoscale structures. A broad range of materials are covered, from fiber-reinforced and interpenetrating-phase composites to varistors and ferroelectrics. Perhaps half of the contributions deal with Si_3N_4, mullite, or composite interfaces. A common theme is the study of phenomena at the atomic level. Papers range from broad-based models to explain behavior in many different systems to phenomenological studies of specific systems. Two chapters, in particular, that highlight the theme of the conference are the contribution of Ackler and Chaing and the manuscript of Peteves, et al. Ackler uses a sophisticated model to predict and describe the distribution of glassy phase during liquid-phase sintering and then sets up a series of directed experiments. The Peteves manuscript details the development of microstructure during ceramic and composite joining. They use that knowledge to optimize the strength of joints.

The organizers apparently went to great lengths to put on a focused conference, invite outstanding researchers, and edit a high-quality volume. These chapters can serve as a lasting snap shot of the current state-of-the-art or as a contemporary review of work coming from some of the best research facilities in the world. Many of the authors put great effort into their manuscripts, making it more like a special issue of a quality peer-reviewed journal than a conference proceedings. This volume should prove useful to those who conduct research in this field as well as those who are looking for a who-is-doing-what overview.

Reviewer: *Bill Fahrenholtz is a research professor at the University of New Mexico. He works in the Advanced Materials Laboratory, a ceramics research facility operated by Sandia National Laboratories. His area of expertise is ceramic processing. For the past six years Fahrenholtz has worked on developing processing routes for ceramic-metal composites.*