## Multiphase Macromolecular Systems (Contemporary Topics in Polymer Science, Vol. 6)

*Edited by Bill M. Culbertson*
*(Plenum Press, New York, 1989),*
*733 pages*
*ISBN: 0-306-43374-5*

This edited volume, containing 42 technical contributions, arose out of a symposium in late 1988 sponsored by the Polymer Division of the American Chemical Society. Recent advances in five types of materials are covered: molecular composites, blends, block/graft copolymers, ionomers, and interpenetrating networks. The book is ably edited by Bill Culbertson, who has edited the ACS Polymer Division's Polymer Preprints for the past nine years.

Most of the papers were invited talks at the symposium, but to balance the book's content by subject area, Culbertson solicited additional papers from the poster session. In addition, for each of the five types of materials covered, a review article is included; those on blends (Robeson) and IPNs (Sperling) are particularly detailed and excellent. In several respects, this book reminds me of counterparts in the successful ACS Symposium Series, though it is nearly twice their length. Compared with its predecessors in the Contemporary Topics in Polymer Science series, this book is both focused (the first four had no specific theme) and lengthy (twice the length of Volume 5, published in 1984), making the current volume more useful as a reference work. This utility is enhanced by a very thorough subject index. While the intended audience for most of the contributions is clearly those who already have some familiarity with multiphase polymers, the inclusion of the review articles means that the reader need not be intimately familiar with any one of the five particular subclasses encompassed.

Due to the symposium's origin, a large proportion of the contributions focus on the synthesis of multiphase materials, though morphological and rheological studies are also represented, and a few contributions have a strong applications orientation. The thrust of most contributions is experimental results, though two papers on blend miscibility have major theoretical components, and one contribution on the spontaneous curvature in diblock copolymers (Witten) is purely theoretical. Although some of the work has appeared elsewhere, this collection exposes readers familiar with only one of the five subclasses of materials to related, recent developments in the other four. Many of the contributions have either not appeared elsewhere, or have appeared only in preprint form, but their full stories are told here. A particularly striking contribution by Eisenbach presents years of work on nonhydrogen-bonded polyurethanes with monodisperse hard segments, work not found elsewhere in the readily accessible literature.

Research in multiphase polymers is widespread and rapid. The work presented in this volume was performed over two years ago, so the volume cannot completely describe recent developments. Most of the contributions are from North America, though Europe is strongly represented. Japan, China, Israel, and Australia also contribute. While some unevenness in edited volumes is inevitable, the papers here are very good overall, both in content and presentation. One minor drawback, which makes the book difficult to skim through, is that only 40% of the contributions contain abstracts. This compendium of research results is not suited to course instruction, but it (particularly the five review articles) could serve well as background reading for either graduate students or experienced researchers beginning work in the area. In summary, *Multiphase Macromolecular Systems* does a good, balanced job of presenting current research in the area, and will be especially useful to those designing new multiphase polymers.

*Reviewer: Richard A. Register is assistant professor of chemical engineering at Princeton University and a member of the Princeton Materials Institute. His research interests lie in the morphology, structure/property relationships, and flow behavior of multiphase polymers, including block copolymers, polymer blends, and ionomers.* □

## CORRECT ANSWERS TO THE *JMR* "FIGURE THIS" CONTEST

**Following are the correct captions for figures in the *JMR* "Figure This" Contest. Also identified are the title and authors of the article in which the figure appeared and the issue of *Journal of Materials Research* in which it was published.**

**Figure 1**: Silicon nitride crystallites, from "Synthesis of silicon nitride precursor powders..." by P. Ho, R.J. Buss, and R.E. Loehman (Vol. 4, No. 4, July/August 1989, p. 878).

**Figure 2**: Holes in alumina, from "Nanometer scale electron beam lithography" by J.L. Hollenbeck and R.C. Buchanan (Vol. 5, No. 5, May 1990, p. 1063).

**Figure 3**: Anatase in titania, from "Growth of anatase in thin films" by D.G. Howitt and A.B. Harker (Vol. 2, No. 2, March/April 1987, p. 206).

**Figure 4**: Twins in YBaCuZnO, from "TEM studies on twin boundary" by Y. Zhu, M. Suenaga, and Y. Xu (Vol. 5, No. 7, July 1990, p. 1385).

**Figure 5**: Displacement cascades, from "Fractal geometry of collision cascades" by F. Rossi, D.M. Parkin, and M. Nastasi (Vol. 4, No. 1, January/February 1989, p. 138).

**Figure 6**: Nanophase material, from "Clusters and cluster assembled materials" by R.P. Andres, R.S. Averback, W.L. Brown, L.E. Brus, W.A. Goddard III, A. Kaldor, S.G. Louie, M. Moscovits, P.S. Peercy, S.J. Riley, R.W. Siegel, F. Spaepen, and Y. Wang (Vol. 4, No. 3, May/June 1989, p. 712). Adapted from: "Nanocrystalline materials: a first report," R. Birringer, U. Herr, and H. Gliter (*Suppl. Trans. Jpn. Inst. Met. Supp.*, Vol. 27, p. 43, 1986).

**Figure 7**: Bariumaluminosilicate, from "Crystallization kinetics" by N.P. Bansal and M.J. Hyatt (Vol. 4, No. 5, September/October 1989, p. 1263).

**Figure 8**: Resist pattern reticulation, from "Electron-beam hardening of polymers" by J. Krishnaswamy, L. Li, G.J. Collins, H. Hiraoka, and M.A. Caolo (Vol. 3, No. 6, November/December 1989, p. 1262).

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