Preface

This is the second edition of Melt Rheology and its Role in Plastics Processing, although the title has changed a bit to indicate its broadened scope. Advances in rheometer technology and polymer science have greatly enhanced the usefulness of rheology in the plastics industry. It is now possible to design polymers having specific molecular structures and to predict the flow properties of melts having those structures. In addition, rheological properties now provide more precise information about molecular structure.

Our primary interest is in practical applications, not basic polymer science, which is the subject of several excellent books. But an understanding of key aspects of polymer physics is essential to be an intelligent user of rheology, and we provide the information necessary to build this understanding. And extensive references are provided for those wishing to pursue certain issues in greater depth.

Thus, while our primary audience is applied polymer scientists and plastics engineers, the book should also be of use to postgraduate students in polymer science and engineering, and the first edition has been used as a text for graduate courses.

After an introductory chapter we start our discussion of melt rheology with a chapter mainly about viscosity, because most readers will be familiar with this concept and some of its applications. Discussions involving tensors that were present in several chapters of the first edition are now concentrated in Chap. 5, and mastery of this material is not required for an understanding of the other chapters.

The rheology of filled polymers is now too big a subject to deal with in a chapter and is the subject of entire books, including the three listed at the bottom of this page.

Kurt Wissbrun, coauthor of the first edition, is retired from his successful career as an industrial scientist, and the applied science expertise essential to the goals of this book is now provided by Jian Wang. The authors are grateful to many people who provided advice and information that added in important ways to the

usefulness of the book. These include Tom Butler, Chan Chung, Albert Co, Stephane Costeux, Willem deGroot, César García-Franco, Jeffrey Giacomin, Kathy Jackson, Teresa Karjala, Helmut Münstedt, Martin Sentmanat, and John Vlachopoulos.

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