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Polymeric Materials
Structure, Properties, Applications

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“Without natural polymers, there is no life,
without synthetic polymers, no standard of living”

Hans Uwe Schenck

Preface

The book, “Polymeric Materials: Structure – Properties – Applications”, is the result of many years of industrial experience and applied research in the field of plastic materials. The successful application of plastics as engineering materials depends primarily on the ability to identify their properties. History has shown us that the number of applications for polymeric materials and therefore their production has reached levels that were at one time unimaginable. This unparalleled development of an engineering material is anticipated to continue into the future. The ability to apply polymeric materials to innovative and technically demanding applications is attributed to improvements in design principles, new processing techniques, and the determination of the influence of the processing conditions on material characteristics. With no other engineering material are processing, design, and properties so intimately related as with plastics. Therefore, a scientific book concerning polymeric materials must maintain the fine balance between the vast amount of knowledge based on both experience and intuition, and the new scientific endeavors that continue to advance their development.

Many professional colleagues have helped me during the writing of this book. I would like to thank them all for their valuable suggestions and advice. My particular thanks go to Prof. Josef Kabelka for his help in writing the sections concerning filled and reinforced materials as well as their response to multiaxial loading, to Dr. Richard P. Theriault who contributed important suggestions, collected essential information, and, in particular, performed the translation of the chapter 1, 2, 5, 6 and 8, as well as the work Dr. Ed. Immergut, who translated the remaining chapters and reviewed the corrections of the entire book, to Dr. Fabienne Montagne, who has prepared the French version of this book, and Prof. A. Wilhelm Neumann as well as Mr. Norbert Müller, M.Sc., for critically reviewing. I would also like to acknowledge the crucial assistance with the transatlantic logistics and organization provided by Ms. Gabriela Riedel and Ms. Pia Trawiel.

A scientific book develops over many years. Information comes from a multitude of sources including both scientific and industrial specialists via collaborative efforts or literary essays. This book is intended to give the reader a concise overview of the most important aspects of the interrelationship between structure, processing, and applications of polymeric materials. Since it is difficult to include all of the details that are necessary to obtain a full understanding of the subject matter in a single book, further references to relevant literature are suggested at the end of each chapter.

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