book review

High Pressure Chemistry and Physics of Polymers

A. L. Kovarskii (Ed.)

CRC Press, London, 1994, 430 pages

It is well known that the application of high pressures forms an integral part of the science and technology of polymers, embracing topics as diverse as the classic polymerization of low density polyethylene and the effect of hydrostatic pressure on mechanical properties, especially yield behaviour. This book is therefore especially welcome, because it provides a rare opportunity to gain perspective of all aspects of the application of high pressure techniques to polymers. The authors of the nine chapters in this book, all from the former Soviet Union, set themselves the task of producing a comprehensive series of reviews. It is a pleasure to report there can be no complaint that they have not done justice to their subject. Although it is clearly impossible for a single reviewer to judge all areas, this reviewer can confirm that in the subjects of polymer processing, structure and properties, all major contributions are reported in sufficient detail in a totally objective fashion.

Each chapter in this book is self contained but there is very little overlap. All aspects of mechanical properties are included, from compressibility studies through viscoelasticity to yield and plastic deformation behaviour. The latter includes both shock wave compression and hydrostatic extrusion. At a molecular level, there are chapters on crystallization and molecular dynamics. Finally, the chemical topics discussed include polymerization and radiation chemistry under hydrostatic pressure and also polymerization under shock compression.

Inevitably this book is not an easy read, but this reviewer found it to be very rewarding, even if it was possible only to gain a superficial understanding of subjects with which one is unfamiliar. It can be strongly recommended for library purchase and every research group in this area would find it valuable.

Recognising the difficulties which have faced our Russian colleagues in the last few years, it is excellent to report that a contribution to the literature of this nature does perhaps redress for them the inevitable reduction in their level of research activity.

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