Bassett

Developments in Crystalline Polymers--1

Crystalline or, more properly, semi-crystalline polymers continue to present major challenges and opportunities to scientists and technologists alike. On the one hand, scientific understanding of their structure and properties still lags behind that of other economically important, but less complicated materials. On the other hand, there remains very considerable potential for improving properties in systems designed for specific pur poses. Ways are only just being found of transferring inherent molecular properties (such as high modulus) to the macromolecular solid. Beyond these are many possibilities of manipulating the organization of chemical and physical textures towards desired ends. The chapters in this volume are reports, by wen-known and active researchers, on some of the important recent developments ofthese themes. Grubb begins with the fundamental and central problem of determining polymeric microstructure. Polymers sutTer by comparison with other materials in that it has not generany been possible to exploit the high resolution of the electron microscope to determine their microstructure in adequate detail. However, recently, ways have been found of studying representative lamellar textures in melt-crystallized polymers. When fully exploited these must add greatly to our detailed knowledge and provide a firmer fundamental base for future developments. Radiation damage bears the primary responsibility for restricting electron microscopy. In his chapter, Kener recounts how appreciation of this fact led him into a fascinating study of ever deeper aspects of radiation damage in polyethylene over two decades, often controversiany but invariably clarifying the basic understanding of an area now of increasing commercial importance.

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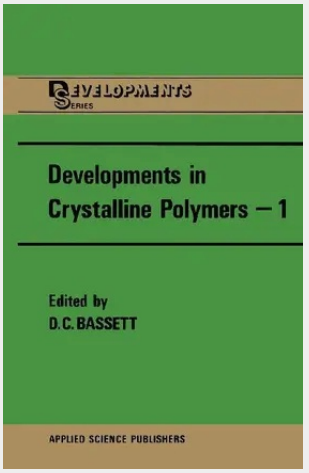

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