Book Reviews

Physical Properties of Polymers Handbook. Edited by James E. Mark (University Of Cincinnati). American Institute of Physics Press: Woodbury, NY. 1996. xv + 723 pp. $290.00. ISBN 1-56396-295-0.

The goal of this handbook is to present modern topics not covered by other handbooks in a concise, portable format. In keeping with the latter goal, the book is considerably shorter than most handbooks and is not a comprehensive listing of data for a wide variety of polymers. A particularly nice feature is that most chapters provide several pages of general information on the subject as well as short tables of data for selected polymers. Typically, this is considerably more information than found in a general polymer textbook, but with fewer details than afforded by a special monograph on the subject. This coverage of theory and techniques behind the data gives the reader enough information to become conversant and to follow the literature on the subject. Thus, the handbook can also be useful to synthetic chemists who are actively collaborating with physical chemists, chemical physicists, and engineers, even though it was specifically designed for the latter.

The first two and last two chapters of the book provide general, easy to locate information on polymers. The first chapter briefly discusses general structural features of polymers ranging from simple linear chains to complex dendrimers. The second chapter is a 10 page table listing the structural formula, names, and acronyms of important polymers. The last two chapters consist of a short glossary defining commonly used terms and tables of units and conversion factors. Sandwiched in between these 4 chapters are 48 other chapters that are short overviews of a multitude of modern topics under the major categories of theory; thermodynamic properties; spectroscopy; mechanical properties; crystallinity and morphology; electrooptical and magnetic properties; responses to radiation, heat, and chemical agents; and miscellaneous properties (surface, acoustic, gas permeability). In addition to the expected topics relating to thermal and mechanical properties, there are many newer topics such as rotational isomeric state models, computational parameters, fractal dimensions, refractive indices, electroluminescence, and NMR spectroscopy. Chapters are also devoted to biodegradable polymers, photoresist polymers, and polymers with liquid crystalline, nonlinear optical, piezoelectric, ferroelectric, pyroelectric, and conducting properties.

Because these chapters were written by different authors, both the content and style of each vary considerably. While most authors do an excellent job of giving the reader relevant background information to introduce the novice to the subject, a few give only minimal information on theory and techniques with an extensive tabular listing of data. There are some typograpical and spelling errors, but these are not common. In general, the chapters are well documented with numerous references from this decade. The index is adequate, but in a couple of cases, the Search function on the CD-Rom version uncovered more pages for a keyword.

In summary, chemists and engineers will find this handbook to be a first point reference on a broad range of topics.

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JA965747X

S0002-7863(96)05747-2

Computer Software Reviews

Physical Properties of Polymers Handbook, CD-ROM. Edited by James E. Mark (University of Cincinnati). American Institute of Physics Press: Woodbury, NY. 1996. $127.00. ISBN 1-56396-598-4.

The CD-ROM version of the *Physical Properties of Polymers Handbook* offers all the expected features of a software version of a convenient handbook. The system requirements are a 386-SX PC or better with 4 Mbyte of RAM and Microsoft Windows 3.1 or 3.11, Windows 95, or Windows NT3.5 or later. Macintosh users must have at least a Power Macintosh with 4.5 Mbyte of application RAM, or a Macintosh 68020-68040 with 2 Mbyte of application RAM and System 7.0 or later software. Both require 5 Mbyte of free space on the hard drive and, of course, a CD-ROM drive. Viewing, searching, and printing from the Handbook are done with a software program called Adobe Acrobat which is automatically installed onto the computer's hard drive during the installation procedure. A very small pamphlet of 11 short pages provides ample information to get the user started. Its brevity inspires reading rather than the typical dread provoked by a lengthy, formidable manual.

The program is easy to use with pull-down menus as well as icons on a toolbar, so there is virtually no learning curve. Pages may be viewed in total or easily magnified to read data. The nicest feature is the ease in location of information. This may be done either through the Table of Contents, from which any chapter is quickly accessed by a click of the mouse, or through the Search command which allows location of keywords or phrases. The search may be narrowed to several words or phrases, thus improving on the index found in the printed version of the Handbook. It is also useful to initially use the Search routine to locate broader categories followed by the Find function or icon to focus on subgroups of information. In several cases, information was found with the CD-ROM Search that was not located from the index in the print version. Also, at least one chapter of the software version contains about 20 extra pages of data that were not included in the printed version.

More information about the actual content of the Handbook is given in the review of the print version of the Handbook.

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S0002-7863(96)05933-1