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A review of: "Organic Molecular Solids Properties and Applications", edited by William Jones, CRC Press, Boca Raton, 1997; ISBN 0-8493-9428-7; xiv + 426 pages; $145.00.

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Book Review

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"Organic Molecular Solids Properties and Applications", edited by William Jones, CRC Press, Boca Raton, 1997; ISBN 0–8493–9428–7; xiv + 426 pages; $145.00.

In recent years, the scientific and technological investigations of organic solids have resulted in significant commercial activity in a number of areas. Indeed, there are now major scientific conferences devoted to numerous subtopics that fall under the broad umbrella of organic solids. This edited volume is a collection of twelve chapters that seeks to highlight developments and methodologies in a number of areas of current interest. As such, it is reminiscent of two similar books edited by British scientists, namely "An Introduction to Molecular Electronics" edited by M.C. Petty, M.R. Bryce, and D. Bloor, Edward Arnold, 1995 and "Molecular Electronics" edited by G.J. Ashwell, Research Studies Press, Wiley, 1992. The authors of the present volume are from the United Kingdom, Germany, Japan, India, and Cyprus. The topics covered in the twelve chapters are fullerenes, nanotubes, and related materials; thermotropic liquid crystals; Langmuir-Blodgett assemblies; methods of characterization; theoretical methods for crystal structure determination; reactivity and crystal design; linear optical properties; nonlinear optical crystals; semiconducting and photoconducting solids; superconducting solids; conducting polymers; magnetic properties. Each article is individually referenced and there is a twelve page subject index.

Overall, the collection of chapters meets the editor's objectives of presenting state-of-the-art reviews of topics that are of technological significance and the role of crystal packing and its relationship to physical properties. Exceptions to this are noted below.

Several chapters should prove particularly useful. The chapter on fullerenes, etc. is very timely. The chapter on theoretical methods for crystal structure determination is an excellent summary of the state-of-the-art of current methodologies covering *ab initio* approaches to crystal packing including the problem of poly-

morphism and use of powder data combined with theoretical methods for structure solution in the absence of single crystal specimens. The chapter on linear optical properties is a review of plastic optical fibers(POF). While this may not have been the first topic that would come to mind concerning linear optical properties of organic molecular crystals, the article is a valuable summary. POF have been extensively researched in Japan over the past 15 years, and this chapter is a good summary of that work. The chapter on semiconducting and photoconducting solids is a good overview of current work, especially in molecular doped polymers and conjugated polymers.

Chapters that have obvious shortcoming include those on methods of characterization of organic solids and on magnetic properties. The chapter on characterization has no references more recent than 1974 and most of the information can be found in an elementary textbook on crystallography.

The chapter on magnetism completely ignores the extensive reports of ferromagnetism in charge transfer salts based on decamethylmetallocenes. While the role of impurities in these materials has never been clarified, some discussion of the materials would seem appropriate. The discussion of ferromagnetism in polymers is too brief. For example, at least two reports have attributed the ferromagnetism reported for the diacetylene dinitroxide (Table XII.3) as arising from iron impurities. The difficulty of reproducing experimental results is noted, but reasons for this, such as reactivity of certain radicals to ambient oxygen, are not given. Such perspectives would be useful to the reader.

Overall, this book will prove useful to researchers active in the area of molecular crystals as well as to students seeking background in these topics.

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