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A review of: "Phthalocyanine Materials: Synthesis, Structure and Function by Neil B. Mc Keown, Cambridge University Press, 1998; ISBN 0-521-49623-3; xvii + 193 pages; \$74.95"

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Book Review

(Received February 21, 1999)

"Phthalocyanine Materials: Synthesis, Structure and Function" by Neil B. McKeown, Cambridge University Press, 1998; ISBN 0-521-49623-3; xvii + 193 pages; \$74.95.

If your first reaction to the title of this book goes along the lines of what could an author write on the subject of phthalocyanines that is significantly different from the four volumes edited by Leznoff and Lever, you are in for a pleasant surprise. The author has come up with an organization and treatment that is up-to-date and a useful addition to the already immense literature of phthalocyanines in molecular and polymeric forms. The book consists of a preface, 8 chapters, a 3 page appendix listing the phthalocyanines commercially available from Aldrich, a 30 page list of references, and a 10 page subject index.

In the preface, the author presents a detailed comparison of phthalocyanines and fullerenes, the latter termed "fashionable". His points are well-taken, but the addition of several facts would have been valuable, namely phthalocyanines are already materials of commerce and the subject of many technology programs. If fullerenes do not become readily available in quantity via a convenient process, they will never be taken seriously in any technological arena. The author aims the book at newcomers to the subject, such as graduate students. The book will prove quite useful for this purpose. The author admits to oversimplification of many aspects of molecular physics, and this is certainly true.

The chapters are titled as follows: "An introduction to the phthalocyanines"; "Phthalocyanine synthesis"; "The fabrication of phthalocyanine materials"; "Optical properties"; "Electrical conductivity"; "Optoelectronic properties of phthalocyanine materials"; "Miscellaneous properties and uses of Pc materials"; "Future developments".

The introductory chapter finishes with a listing of review articles and books dealing with phthalocyanines; this is quite a useful feature. The chapter on synthesis is less detailed than related chapters in the Leznoff and Lever work. The

chapter on fabrication is the longest (56 pages) in the book, and is the great strength of the book. It reviews crystal structures, thin film fabrication, Langmuir-Blodgett films, and an extensive survey of liquid crystalline phthalocyanines, including lyotropic phases. The chapter on optical properties has a useful summary of $X^{(3)}$ measurements. It also mentions application in optical limiting (usually observed as reverse saturable absorption), but doesn't discuss saturable absorption, observed in siloxy-substituted naphthalocyanines by A.F. Garito and coworkers. The chapter on optoelectronic properties has a section on liquid crystalline electrochromics. The last paragraph of the book points out that application of organics as active elements requires rigorously purified materials. This perspective is most definitely applicable to the study of ferromagnetism in the previous chapter on miscellaneous properties.

To summarize, the author has done a good job by preparing a readable book on a still growing subject. With a literature coverage into 1996, the book will be useful to students and researchers interested in phthalocyanines.

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