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Book reviews

Organic Photoreceptors for Imaging Systems
P.M. Borsenberger and D.S. Weiss, Marcel Dekker, New York, 1993, 464 pages, $135
ISBN 0-8247-8926-1

It is of interest to observe the ways in which applied scientists in the field of electronics and optoelectronics have come to appreciate the richness, diversity and usefulness of chemistry and also to note that chemists are increasingly aware of the enormous area of potential development. Many of the bottlenecks in the development of electronic materials for devices are materials-related and as the chemist is aware, the properties of bulk materials stem from those of the isolated molecule. First though, the chemist must be aware of the technological challenge, and in this text Borsenberger and Weiss lay out the basis of electrophotography or xerography.

The process is briefly as follows. An electrostatic latent image is created on the surface of a photoconducting material by first charging its surface followed by exposure to UV radiation. The image is developed using toner particles which are transferred electrostatically to a paper receiver and then fused permanently into place. The key step is of course the formation of the latent image on the photoreceptor and although early materials were elemental in composition (sulphur, selenium), followed in the 60s by chalcogenide glasses, the demands of durability, flexibility, stability etc. have led to increased usage of organic materials.

The absorption of image exposure by the photoreceptor causes electron–hole pairs which separate under the electrostatic field to the free surface and the substrate electrode. This process builds up an electrostatic charge pattern of the image to be copied. There are certain important electronic criteria, all discussed in detail in the book. Theories of photogeneration are described prior to an introduction to organic materials of relevance; phthalocyanines, polyarenes and a range of other materials both polymeric and polydisperse. Similarly, theories of charge transport are introduced prior to an extended discussion of electron, hole and bipolar transport in a wide range of polymeric and non-polymeric species. The range of topics covered is impressive, and in addition to coverage of theoretical models there is detail on the technology of photoreceptor production and fatigue effects as well as a lengthy description of the properties, the synthesis, and the characterisation of the various classes of photoreceptor.

The book provides a very useful way of coming rapidly up to speed in this technologically important and still growing area. It is written in the form of a review, with relatively little text devoted to extensive looks forward or back. The style is businesslike and to the point. It constitutes a comprehensive and coherent treatment of the theory and practicalities of xerography, and represents excellent value for researchers entering or working in this field.

A.J. McCaffery
School of Chemistry and Molecular Sciences
University of Sussex
Brighton BN1 9QJ
UK

New Aspects of Organic Chemistry II: Organic Synthesis for Materials and Life Sciences
Z. Yoshida and Y. Ohshiro (eds.), VCH, Weinheim, 1992, 521 pages, DM 225, £85.00
ISBN 3-527-290134-1

New Aspects of Organic Chemistry II is a collection of lectures presented in November 1991 at the Fifth International Kyoto Conference on New Aspects of Organic Chemistry. The book is divided into three sections: (I) Efficiency in Organic Synthesis (242 pp.); (II) Organic Synthesis for Materials Sciences (186 pp.); (III) Organic Synthesis for Life Sciences (190 pp.).

The first and largest section on Efficiency in Organic Synthesis contains seven contributions on organometallic topics by G. Wilke, H. Alper, I.P. Beletskaya, K. Smith, K. Koga, H. Sakurai and G. Boche together with articles by H.P. Husson, A. Dondoni, A. de Meijere and S.E. Denmark.

The second section on Organic Synthesis for Materials Science contains an article by M. Ishikawa on the Synthesis and Conducting Properties of Poly[(disilany-