

Book Review

Photoreactive Polymers

Edited by V.V. Krongauz and A.D. Trifunac, ISBN: 0-412-98401-6, Chapman and Hall, London, 1995.

This is an edited text containing a total of eleven chapters dealing with the mechanistic features of photosensitive polymeric materials. I must admit that prior to receiving this book for review I had not known of its existence. By the time this review appears the book will be two years old. Despite this the book presents to the reader, in a unique and highly informative way, various aspects of the mode of action of photopolymer materials. Written by several authorities in the field it provides a very descriptive picture with a strong scientific flavour of the different types of photoprocesses that have evolved over the years since the original use of Asphalt by Niepce, the latter being somewhat controversial since the original birth of photography was assigned to Daguerre.

The first chapter, written by J.L. Marignier, is classic and a real pleasure to read. It presents the reader with a clear historic picture of the conception and subsequent development and use of Asphalt for photoresist materials. Chapter 2 then suddenly dives into recent developments in radiation curing science with C. Decker providing the reader with a marked contrast to the earlier developments. Both these chapters form a subsection of the book dealing with the history and state of the art of the field. Section 2 then begins with time-resolved processes by J.P. Fouassier in Chapter 1 (again) where the use of laser techniques has provided vital clues to our understanding of the high speed processes involved in the photocuring of polymers through the use of photoactive initiators and sensitizers. This is followed by an interesting and detailed discussion by K. Maeda in Chapter 2 of the use of hexaarylbiimidazolyl compounds as photochromic materials for photopolymers. These compounds have a number of valuable properties in this regard that form the basis of numerous industrial patents. Visible light sensi-

tisation processes are a major area of industrial development, especially for laser curing technologies. These processes are described in depth by T. Yamaoka and K. Naitoh in Chapter 3 where electron and energy transfer processes play a primary role. Chapter 4 provides recent evidence for the role of electron transfer between hexaarylbiimidazoles and a visible sensitizer and is written by Y. Lin, A. Liu, A.D. Trifunac and V.V. Krongauz. The editor, V.V. Krongauz, then goes on in Chapter 5 to describe in detail the role of diffusion processes in the polymer matrix and the significance of anisotropic photopolymerisation processes. Polymeric photoinitiators with bound benzoin ether groups for improved compatibility and solubility are then described in Chapter 6 by K.D. Ahn. Liquid crystalline polymers are covered by C. Bowry in Chapter 7 which provides a simple but useful picture of their mode of action. Section 3 then continues with an in-depth Chapter 1 on holographic recording materials by R.A. Les-sard, R. Changkakoti and G. Manivannan. Various photopolymer systems are described, coupled with the function of different sensitizers. The last chapter in this section, by N.P. Hacker, deals with various positive and negative photoresist materials and their development.

Overall the book provides a valuable and novel approach to our understanding of photopolymer materials. It proves an interesting overview of the historical developments, investigations and applications of the different types of materials. Mechanisms and applications are integrated in a unique way that inspires and interests and is consequently a pleasure to read. In all this is a useful book for the specialist and beginner alike for chemists, physicists and materials scientists and is a must for academics involved in both research and teaching. With regard to the latter it makes an excellent foundation text for specialist courses.

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