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A Review of: "Smart Light-Responsive Materials—Azobenzene-Containing Polymers and Liquid Crystals, edited by Yue Zhao and Tomiki Ikeda"

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Book Review

Smart Light-Responsive Materials—Azobenzene-Containing Polymers and Liquid Crystals, edited by Yue Zhao and Tomiki Ikeda, John Wiley & Sons, Inc., Hoboken, NJ, 2009; ISBN: 978-0-470-17578-1; 546 pp.; \$140.00.

Azobenzene-containing materials have attracted a great deal of attention over the past two decades. Upon exposure to light, the azobenzene chromophores undergo trans-cis-transisomerization. This photo-isomerization phenomenon of the azobenzene chromophores has led to significant investigations in understanding the mechanisms and in exploring potential applications. This book, with contributions by leading researchers in the field, covers a broad range of smart light-enabled azobenzene containing polymers and liquid crystals developed during the past 15 years. The book presents the novel functionalities of the azobenzene materials, their smart photo-responsive properties, and their possible applications. The photo-responsive materials include light-deformable elastomers, photo-controllable polymer micelles and colloids, optically tunable diffraction gratings, etc. Each chapter in the book offers a critical review of the related azobenzene materials, smart light-sensitive behaviors, applications, and perspectives on future research and development. Extensive references are listed at the end of each chapter. Detailed discussions of photo-induced mechanical effects of the azobenzene materials are provided, covering photo-induced surface patterning with amorphous azobenzene-functionalized polymers, photo-induced deformation with azobenzene polymer colloidal spheres, and photo-induced mechanical movement with liquid crystalline azobenzene polymers. Solution self-assembled photosensitive micro- and nanostructures of the azobenzene polymers, two-dimensional motion in azobenzene liquid crystalline polymers, new azobenzene block copolymers, and azobenzene-containing hybrid silica materials are discussed. Basic background information on the photo-induced phenomena with the azobenzene materials is also presented. This book is valuable to both academic and industrial researchers in the field of azobenzene-containing materials. Graduated students interested in the areas will mostly benefit from this comprehensive review book. It should also be recommended to scientists in developed smart light-responsive materials and those interested in the azobenzene-related materials.

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