1. Record Nr. UNINA9911020163203321

Autore	Schnabel W (Wolfram)
Titolo	Polymers and light : fundamentals and technical applications / / W. Schnabel
Pubbl/distr/stampa	Weinheim, : Wiley-VCH Chichester, : John Wiley [distributor], c2007
ISBN	9786610921720 9781280921728 1280921722 9783527611027 3527611029 9783527611034 3527611037
Descrizione fisica	1 online resource (399 p.)
Disciplina	547.7 620.19204295
Soggetti	Polymers - Optical properties Polymers - Properties
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Polymers and Light; Contents; Preface; Introduction; Part I Light-induced physical processes in polymers; 1 Absorption of light and subsequent photophysical processes; 1.1 Principal aspects; 1.2 The molecular orbital model; 1.3 The Jablonski diagram; 1.4 Absorption in non-conjugated polymers; 1.5 Absorption in conjugated polymers; 1.6 Deactivation of electronically excited states; 1.6.1 Intramolecular deactivation; 1.6.2 Intermolecular deactivation; 1.6.3 Energy migration and photon harvesting; 1.6.4 Deactivation by chemical reactions; 1.7 Absorption and emission of polarized light 1.7.1 Absorption1.7.2 Absorption by chiral molecules; 1.7.3 Emission; 1.8 Applications; 1.8.1 Absorption spectroscopy; 1.8.1.1 UV/Vis spectroscopy; 1.8.1.2 Circular dichroism spectroscopy; 1.8.1.3 IR spectroscopy; 1.8.2 Luminescence; 1.8.3 Time-resolved spectroscopy; 1.8.3.1 General aspects; 1.8.3.2 Experimental techniques; 1.8.3.3

Applications of time-resolved techniques; 1.8.3.3.1 Optical absorption; 1.8.3.3.2 Luminescence; References; 2 Photoconductivity; 2.1 Introductory remarks; 2.2 Photogeneration of charge carriers; 2.2.1 General aspects; 2.2.2 The exciton model
2.2.3 Chemical nature of charge carriers2.2.4 Kinetics of charge carrier generation; 2.2.5 Quantum yield of charge carrier generation; 2.3 Transport of charge carriers; 2.4 Mechanism of charge carrier transport in amorphous polymers; 2.5 Doping; 2.6 Photoconductive polymers produced by thermal or high-energy radiation treatment; 2.7 Photoconductive polymers produced by plasma polymerization or glow discharge; References; 3 Electro-optic and nonlinear optical phenomena; 3.1 Introductory remarks; 3.2 Fundamentals; 3.2.1 Electric field dependence of polarization and dipole moment
3.2.2 Electric field dependence of the index of refraction3.3 Characterization techniques; 3.3.1 Second-order phenomena; 3.3.1.1 Determination of the hyperpolarizability ; 3.3.1.2 Determination of the susceptibility ((2)); 3.3.2 Third-order phenomena; 3.3.2.1 Third harmonic generation; 3.3.2.2 Self-focusing/defocusing; 3.3.2.3 Two-photon absorption (TPA); 3.3.2.4 Degenerate four-wave mixing (DFWM) and optical phase conjugation; 3.4 Nonlinear optical materials; 3.4.1 General aspects; 3.4.2 Second-order NLO materials; 3.4.2.1 Guest-host systems and NLO polymers; 3.4.2.2 Orientation techniques
3.4.3 Third-order NLO materials3.5 Applications of NLO polymers; 3.5.1 Applications relating to telecommunications; 3.5.2 Applications relating to optical data storage; 3.5.3 Additional applications; References; 4 Photorefractivity; 4.1 The photorefractive effect; 4.2 Photorefractive formulations; 4.3 Orientational photorefractivity; 4.4 Characterization of PR materials; 4.5 Applications; References; 5 Photochromism; 5.1 Introductory remarks; 5.2 Conformational changes in linear polymers; 5.2.1 Solutions; 5.2.2 Membranes; 5.3 Photocontrol of enzymatic activity
5.4 Photoinduced anisotropy (PIA)

Sommario/riassunto

This first book to focus on the important and topical effect of light on polymeric materials reflects the multidisciplinary nature of the topic, building a bridge between polymer chemistry and physics, photochemistry and photophysics, and materials science.Written by one experienced author, a consistent approach is maintained throughout, covering such applications as nonlinear optical materials, core materials for optical waveguides, photoresists in the production of computer chips, photoswitches and optical memories.Advanced reading for polymer, physical and organic chemists, manufact