1. Record Nr. UNINA9910420950103321

Titolo	Photosynergetic responses in molecules and molecular aggregates / / Hiroshi Miyasaka [and three others], editors
Pubbl/distr/stampa	Gateway East, Singapore : , : Springer, , [2020] ©2020
ISBN	981-15-5451-X
Edizione	[1st ed. 2020.]
Descrizione fisica	1 online resource (X, 593 p. 395 illus., 290 illus. in color.)
Disciplina	540.151
Soggetti	Photoelectrochemistry
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Advanced control of photochemical reactions leading to synergetic responses in molecules and mesoscopic materials -- Advanced electronic structure theory for high accuracy prediction of higher excited states and its application to photochromic molecules -- Enhanced and selective two-photon excitation of molecular vibronic states using entangled photons -- Stepwise two-photon photochromism -- Suppression of internal conversions from pseudo-degenerate excited electronic states -- Advanced function control of photochemical reactions using mesoscopic structures -- Plasmon-associated control of chemical reaction at nanometer scale -- Modulations of electronic states in plasmonic strong coupling systems and their application to photochemical reaction fields -- Photosynergetic effects on triplet-triplet annihilation upconversion processes in solid studied by theory and experiments -- Hot carrier transfer and carrier manipulation of semiconductor nanocrystals -- The confinement and migration of charge carriers in halide perovskites -- Plasmon induced carrier transfer for infrared light energy conversion -- Controlling optical properties of multinary quantum dots for developing novel photoelectrochemical reactions -- Photosynergetic enhancement of photosensitivity of photochromic terarylenes -- Creation of molecularly integrated multi-responsive photochromic systems -- Efficient singlet fission in acene-based molecular assemblies -- Synergetic photon upconversion realized by a controlled toroidal

interaction in hexaarylbenzene derivatives -- -Electronic ion-pairing assemblies for photoswitching materials -- Photoinduced morphological transformation and photodriven movement of objects using self-assembly of amphiphilic diarylethene in water -- Functional photoactive materials based on flexible molecules -- Giant amplification of fluorescence -- Cooperative molecular alignment process enabled by scanning wave photopolymerization -- Ultrafast energy transfer of biohybrid photosynthetic antenna complexes in molecular assembly systems -- Biomimetic functions by microscopic molecular reactions in macroscopic photoresponsive crystalline system -- Photoresponsive molecular crystals for light-driven photoactuators -- Interplay of photoisomerization and phase transition events provide a working supramolecular motor -- Development of photoresponsive solid-liquid phase transition systems based on synergetic action of molecules -- Photomechanical effects in crosslinked liquid-crystalline polymers with photosynergetic processes -- Femtosecond pump-probe microspectroscopy and its application to single organic nanoparticles and microcrystals -- Single-molecule level study and control of collective photoresponse in molecular complexes and related systems -- Cooperative and hierarchal photoresponses of molecular assembling processes probed by organic fluorescent molecules -- Fabrication of charge-transfer complex nanocrystals toward electric field-induced resistive switching -- Turn-on mode photoswitchable fluorescent diarylethenes for super-resolution fluorescence microscopy -- Crystallization control of the photoresponsible diarylethene film with an aluminum plasmonic chip.

Sommario/riassunto

This book compiles the accomplishments of the recent research project on photochemistry “Photosynergetics”, supported by the Ministry of Education, Culture, Sports, Science and Technology of Japan, aiming to develop and elucidate new methods and molecules leading to advanced utilization of photo-energies. Topics include photochemical responses induced by multiple excitation, multiphoton absorption, strong modulation of electronic states, developments of new photofunctional molecules, mesoscopic actuations induced by photoexcitation, and novel photoresponses in molecules and molecular assemblies. The authors stress that these approaches based on the synergetic interaction among many photons and many molecules enable the expansion of the accessibility to specific electronic states. As well, they explain how the development of reaction sequences and molecules/molecular assemblies ensure “additivity” and “integration” without loss of the photon energy, leading to new photoresponsive assemblies in meso- and macroscopic scales. .