

TABLE OF CONTENTS

Preface	iii
---------------	-----

I - Dye-Sensitized Solar Cells

Femtosecond Laser Pulse Induced Electron Transfer From a Chromophore With a Long Rigid Molecular Spacer

L. Gundlach, R. Ernstorfer, S. Felber, W. Storck, E. Galoppini, Q. Wei, R. Eichberger, and F. Willig	1
--	---

Ultrafast Direct and Indirect Electron Injection Processes in Photo-Excited Dye-Sensitized Nanocrystalline ZnO Film

A. Furube, R. Katoh, T. Yoshihara, Y. Tamaki, M. Murai, K. Hara, S. Murata, H. Arakawa, and M. Tachiya	13
--	----

Electronic Coupling Calculations for Ultrafast Photoinduced Charge Transfer Processes From Aromatic Adsorbates to TiO₂ Nanocrystals

P. Persson and M. J. Lundqvist	27
--------------------------------------	----

Semiconductor-Dependent Interfacial Electron Transfer Studied by Ultrafast Infrared Spectroscopy

X. Ai, J. Guo, N. A. Anderson, and T. Lian	38
--	----

Anchoring Group and Auxilary Ligand Effects on the Binding of Ruthenium Complexes to Nanocrystalline TiO₂ Photoelectrodes

K. Kilså, E. I. Mayo, J. Katz, B. S. Brunshwig, H. B. Gray, N. S. Lewis, and J. R. Winkler	49
--	----

Ab-Initio Electronic Structure and Molecular Dynamics Simulations of the Ultrafast Electron Injection in Dye Sensitized TiO₂

W. R. Duncan, W. Stier, and O. V. Prezhdo	64
---	----

The Influence of Dye Protonation Upon the Performance of Dye-Sensitized Solar Cells

N. Hirata, E. Palomares, Md. K. Nazeeruddin, M. Grätzel, and J. R. Durrant	93
--	----

Interfacial Electron Transfer Dynamics Into the Surface States of ZrO₂ Nanoparticles From Photo-Excited Quinizarin and Its Derivatives

G. Ramakrishna, M. C. Rath, and H. N. Ghosh	99
---	----

Interfacial Condition of Nanoporous TiO₂ Electrode and Charge Transport in Dye-Sensitized Solar Cells

S. Yanagida, S. Nakade, T. Kanzaki, T. Kitamura, and Y. Wada	112
--	-----

Improvement of Cell Performance in the Dye-Sensitized Solid-State Solar Cell

A. Konno, H. Kida, G. R. A. Kumara, and K. Tennakone	118
--	-----

Effects of Substrate on Dye-Sensitized Solar Cell Performance Using Nanocrystalline Titania

S. Ngamsinlapasathian, T. Sreethawong, Y. Suzuki, and S. Yoshikawa	126
--	-----

<i>Improvement of Energy Conversion Efficiencies for Quasi-Solidified Dye Sensitized Solar Cells</i>	
M. Fujimoto, T. Kato, T. Kado, S. Sakaguchi, D. Kosugi, R. Shiratuchi, S. Murai, S. Mikoshiba, and S. Hayase	137

II - Nanomaterials and Nanoelectrodes

<i>Spectroscopy and Photochemistry of Single Organic Nanocrystals Investigated by Using a Far-Field Optical Microscope Coupled with an AFM System</i>	
T. Asahi, V. V. Volkov, H. Matsune, H. Kawai, and H. Masuhara,	150
<i>Development of Visible-Light Active TiO₂ Photocatalysts and Amphiphilic TiO₂ Particles</i>	
T. Ohno, T. Tsubota, K. Nishijima, K. Kakiuchi, and Z. Miyamoto	162
<i>Improved Photocatalytic Hydrogen Evolution Over Mesoporous NiO/TiO₂ Prepared by Single-Step Sol-Gel Technique with Surfactant Template</i>	
T. Sreethawong, Y. Suzuki, and S. Yoshikawa	177
<i>Multicolor Photochromism of TiO₂ Films Loaded with Ag Nanoparticles</i>	
Y. Ohko, K. Naoi, and T. Tatsuma	189
<i>Laser Deposition and Transformation of Gold Nanospheres and Nanorods</i>	
H. Takahashi, Y. Niidome, and S. Yamada	197

III - Carrier Dynamics

<i>Exciton Diffusion and Interfacial Charge Separation in Semiconductor/Antenna Bilayers Studied by FP-TRMC</i>	
J. E. Kroeze, T. J. Savenije, and J. M. Warman	206
<i>Transient Photoconductivity in CdSe Nanoparticles and Nanocrystalline TiO₂ as Measured by Time-Resolved Terahertz Spectroscopy</i>	
C. A. Schmuttenmaer, G. M. Turner, and M. C. Beard	217
<i>Solid-State Nano-Composite Supercapacitors for Optical Modulation</i>	
S.-H. Lee, Y. Yan, C. E. Tracy, J. R. Pitts, and S. K. Deb	225
<i>Construction and Electrochemical Properties of Multilayer Assemblies of Metal and Semiconductor Nanoclusters</i>	
K. Uosaki, M. Okamura, W. Song, T. Kondo, and K. Ebina	235
<i>Control of Metal Nanostructure by Applying Electronic Field for Intense Surface-Enhanced Raman Scattering in Near-Infrared Region</i>	
Y. Sawai, K. Ajito, and K. Murakoshi	248
<i>Localization of Surface Plasmons by Gold Nanowells and Excitation of Fluorophores Immobilized in the Nanowells</i>	
A. Ishida, A. Fujii, and H. Takedatsu	255

IV - Semiconductor Quantum Dots

<i>Relaxation Dynamics, Impact Ionization, and Charge Transfer Dynamics of Excitons in Quantum Dots: Applications to Ultrahigh Efficiency Solar Photon Conversion</i> R. J. Ellingson, J. Blackburn, M. Beard, O. I. Mićić, P. Yu, J. Murphy, and A. J. Nozik	263
<i>Electron-Hole Pair Relaxation Dynamics in Binary Copper-Based Semiconductor Quantum Dots</i> C. Burda and Y. Lou	274
<i>Dynamics of Two-Dimensional Semiconductor Nanoparticle Aggregates and Heterojunctions</i> D. F. Kelley, H. Tu, S. Yang, and K. Mogyorosi	286
<i>Shape Control Fabrication and Photophysics of Semiconductor Nanocrystals</i> K. P. Fritz, T. Mirkovic, P. S. Nair, M. A. Hines, G. D. Scholes, A. Perovic, and D. D. Perovic	301
<i>Effect of Bridge Length on Injection Rates in Ru(II) Polypyridyl Complexes Anchored To Nanocrystalline TiO₂ Through Rigid-Rod Linkers</i> E. Galoppini, P. Piotrowiak, D. Wang, and M. Myahkostupov	309
<i>Fabrication of Novel Nanostructured Core-Shell Particles Using the Size Selective Photoetching Technique</i> T. Torimoto, B. Pal, S.-Y. Murakami, K. Iwasaki, and B. Ohtani	317
<i>Easy Method to Prepare Q-CdS Emitting Intense Band-Gap Fluorescence</i> S. Kuwabata, K. Ueda-Sarson, Y. Tachibana, and T. Torimoto	326
<i>Surface States of Titanium Dioxide Nanoparticles Modified with Eneiol Ligands</i> L. de la Garza, Z. V. Saponjic, N. M. Dimitrijevic, T. Rajh, and M. C. Thurnauer	333
<i>Stabilization of (CdSe)ZnS Quantum Dots in Water Using Amino Acid Capping Groups</i> M. Jones, S.-Y. Ding, M. Tucker, Y.-H. Kim, S. B. Zhang, M. J. Himmel, and G. Rumbles	340
<i>Toward Electronically Coupled Bio-Inorganic Conjugates</i> D. J. Gosztola, Z. Saponjic, L. X. Chen, N. M. Dimitrijevic, L. de la Garza, and T. Rajh	350
<i>Effect of Peptide Ligands on the Quantized Charging Behavior of Monolayer-Protected Au₃₈ Clusters</i> R. L. Donkers, S. Antonello, L. Fabris, and F. Maran	361
<i>Electrochemical Responses and Surface Structure of Gold Electrodes Modified with Nucleic Acid Base Derivatives</i> Y. Sato, M. Osawa, and F. Mizutani	366

V - Exciton Dissociation in Molecular Materials

<i>Discotic Mesophase Materials: Their Use in Organic Field Effect Transistors and Organic Photovoltaics</i>	
N. R. Armstrong, W. Xia, B. Minch, A. Simmonds, C. Carter, C. L. Donley, R. A. P. Zangmeister, A. Drager, S. K. Cherian, L. LaRussa, B. Kippelen, S. Yoo, B. Domercq, D. L. Mathine, and D. F. O'Brien	376
<i>Influence of Codeposition and Molecular Architecture on the Properties and Photovoltaic Performance of CuPc-C₆₀ Heterojunction Devices</i>	
S. M. Schultes, P. Sullivan, S. Heutz, B. M. Sanderson, and T. S. Jones	385
<i>Photoeffects with Porous Layer-by-Layer Assembled Molecular Films</i>	
A. M. Massari, A. Martinson, S. Ahn, and J. T. Hupp	397
<i>A Simple Microcell for Cyclic Voltammetry: Applications in Fullerene Electrochemical Investigations</i>	
M. Eiermann, R. G. Hicks, B. W. Knight, H. Neugebauer, and F. Wudl	407
<i>Excitation Energy Dependence of the Ultrafast Transient Absorption Response of Single-Wall Carbon Nanotubes</i>	
R. J. Ellingson, C. Engtrakul, M. Jones, G. Rumbles, M. J. Heben, and A. J. Nozik	415
<i>N-Doped Carbon Nanofibers as Oxygen Reduction and Hydrogen Peroxide Decomposition Catalysts</i>	
S. Maldonado and K. J. Stevenson	421
<i>Nanoelectronics and Nanosensing Using Carbon Nanotubes</i>	
L. A. Nagahara, R. Zhang, I. Amlani, J. Tresek, T. Hopson, R. Tsui, X. Li, S. Boussaad, and N. Tao	431
<i>Morphological Changes of Conjugated Polymers in Nanostructured Environments</i>	
S. E. Shaheen, D. C. Olson, M. S. White, B. A. Gregg, G. Rumbles, D. S. Ginley, and R.T. Collins	443
Author index	450
Subject index	455