

JOURNAL OF PHOTOPOLYMER SCIENCE AND TECHNOLOGY

Volume 34, Number 1, 2021

Experimental Evaluation and Modeling of Adsorption Phenomena of Nanoliposomes on Poly(dimethylsiloxane) Surfaces	1
<i>Sylvan Sunny Koyagura, Virendra Majarikar, Hiroaki Takehara and Takanori Ichiki</i>	
Polymer-Based Near-Infrared Afterglow Fluorescent Complex of Dye and Rare-Earth-Doped Ceramics	7
<i>Shengjie Fang, Masakazu Umezawa, Kyohei Okubo and Kohei Soga</i>	
Multifunctional Top-Coats Strategy for DSA of High- χ Block Copolymers	11
<i>Xavier Chevalier, Cindy Gomes Correia, Gwenaelle Pound-Lana, Philippe Bézard, Matthieu Sérégé, Camille Petit-Etienne, Guillaume Gay, Gilles Cunge, Benjamin Cabannes-Boué, Célia Nicolet, Christophe Navarro, Ian Cayrefourcq, Marcus Müller, Georges Hadziioannou, Ilias Iliopoulos, Guillaume Fleury and Marc Zelsmann</i>	
Resist Thickness Dependence of Latent Images in Chemically Amplified Resists Used for Electron Beam Lithography	17
<i>Takahiro Kozawa and Takao Tamura</i>	
Investigations of Matrix-Exposure Lithography Using Stacked Linear Arrays of Squared Optical Fibers	27
<i>Toshiyuki Horiuchi, Jun Watanabe, Jun-ya Iwasaki and Hiroshi Kobayashi</i>	
Research on a New Lithography Method Utilizing Laser Speckles for Printing Random Patterns	35
<i>Hiroshi Kobayashi, Iwaoka Tomoki, Kazuki Oi and Toshiyuki Horiuchi</i>	
Development of Materials Informatics Platform	41
<i>Yasumitsu Orii, Shuichi Hirose, Akihiro Fujita and Masakazu Kobayashi</i>	
Fundamental Evaluation of Resist on EUV Lithography at NewSUBARU Synchrotron Light Facility	49
<i>Takeo Watanabe, Tetsuo Harada and Shinji Yamakawa</i>	
Randomness of Polymer Microstructure in the Resist Film as Shot Noise	55
<i>Makoto Muramatsu, Arisa Hara, Satoru Shimura and Hidetami Yaegashi</i>	
Characterization of Surface Variation of Chemically Amplified Photoresist to Evaluate Extreme Ultraviolet Lithography Stochastics Effects	63
<i>Eric Liu, Amir Hegazy, Hyeonseon Choi, Maximilian Weires, Robert Brainard and Gregory Denbeaux</i>	
New Approaches to EUV Photoresists: Studies of Polyacetals and Polypeptoids to Expand the Photopolymer Toolbox	71
<i>Jingyuan Deng, Florian Kaefer, Sean Bailey, Yusuke Otsubo, Zoey Meng, Rachel Segalman and Christopher K. Ober</i>	

Investigating High Opacity and Increased Activation Energy in the Multi-Trigger Resist	75
<i>C. Popescu, G. O'Callaghan, A. McClelland, J. Roth, T. Lada, T. Kudo, R. Dammel, M. Moinpour, Y. Cao and A.P.G. Robinson</i>	
EUV Photochemistry of α -Substituted Antimony Carboxylate Complexes	81
<i>Michael Murphy, Maximilian Weires, Nitinkumar S. Upadhyay, Philip Schuler, Shaheen Hasan, Greg Denbeaux and Robert L. Brainard</i>	
Non-chemically Amplified Negative Molecular Resist Materials using Polarity Change by EUV Exposure	87
<i>Kohei Fujisawa, Hiroyuki Maekawa, Hiroto Kudo, Kazumasa Okamoto and Takahiro Kozawa</i>	
Study on Irradiation Effects by Femtosecond-pulsed Extreme Ultraviolet in Resist Materials	95
<i>Yuji Hosaka, Hiroki Yamamoto, Masahiko Ishino, Thanh-Hung Dinh, Masaharu Nishikino, Akira Kon, Shigeki Owada, Yuichi Inubushi, Yuya Kubota and Yasunari Maekawa</i>	
Evolution of Secondary Electrons Emission During EUV Exposure in Photoresists	99
<i>Roberto Fallica, Stefano Nannarone, Nicola Mahne, Andrea Marco Malvezzi, Andrea Berti and Danilo De Simone</i>	
The Measurement of the Refractive Index n and k Value of the EUV Resist by EUV Reflectivity Measurement Method	105
<i>Yosuke Ohta, Atsushi Sekiguchi, Tetsuo Harada and Takeo Watanabe</i>	
Affinity Analysis of Photoacid Generator in the Thin Film of Chemical Amplification Resist by Contact Angle Measurement	111
<i>Shinji Yamakawa, Ako Yamamoto, Seiji Yasui, Takeo Watanabe and Tetsuo Harada</i>	
Polymerizable Olefins Groups in Antimony EUV Photoresists	117
<i>Michael Murphy, Nitinkumar S. Upadhyay, Munsaf Ali, James Passarelli, Jodi Grzeskowiak, Maximillian Weires and Robert L. Brainard</i>	

JOURNAL OF PHOTOPOLYMER SCIENCE AND TECHNOLOGY

Volume 34, Number 2, 2021

- Computational Lithography for 3-Dimensional Fine Photolithography using
Sophisticated Built-in Lens Mask 123
Tomoaki Osumi, Akio Misaka, Kousuke Sato, Masaaki Yasuda, Masaru Sasago and Yoshihiko Hirai
- Impact of Water Treatment Reactor using TiO₂-coated Micropillar Made
by UV-NIL 127
Kazuki Daigo, Ryota Akama, Noriyuki Unno, Shin-ichi Satake and Jun Taniguchi
- Fabrication of Moth-eye Antireflective Nanostructures via Oxygen Ion-beam Etching
on a UV-curable Polymer 133
Takao Okabe, Katsuyuki Yatagawa, Kazuki Fujiwara and Jun Taniguchi
- Molecular Dynamics Simulation of the Resist Filling Process in
UV-nanoimprint Lithography 139
Hiroki Uchida, Ryosuke Imoto, Tadashi Ando, Takao Okabe and Jun Taniguchi
- Proposal of hybrid deep learning systems for process and material design in
thermal nanoimprint lithography 145
*Sou Tsukamoto, Hidekatsu Tanabe, Ryuhei Yamamura, Kai Kameyama, Hiroaki Kawata,
Masaaki Yasuda and Yoshihiko Hirai*
- Flexible and Semi-Transparent Antenna for ISM Band Fabricated by
Direct Laser Writing 149
Ashiqur Rahman and Akira Watanabe
- Self-assembly of Amphiphilic Peptide in Phospholipid Membrane 155
Anju Kawakita, Noriyuki Uchida, Yunosuke Ryu and Takahiro Muraoka
- Properties of Imidazolium-containing Multiblock Amphiphile in
Lipid Bilayer Membranes 161
Miki Mori and Kazushi Kinbara
- Oriented Nanowire Arrays with Phthalocyanine - C₆₀ Multi-Heterojunctions 167
*Masaki Nobuoka, Koshi Kamiya, Shugo Sakaguchi, Akira Idesaki, Tetsuya Yamaki,
Tsuneaki Sakurai and Shu Seki*
- Designed, Flexible Electrochromic Display Device with Fe(II)-Based
Metallo-Supramolecular Polymer Using Mechanically Etched ITO Film 175
Masayoshi Higuchi and Yukio Fujii
- Micropatterning Performance and Physical Characteristics of Water-soluble
High Molecular Weight Polysaccharide Photoresist Materials 181
Toru Amano, Makoto Kobayashi and Satoshi Takei

Effect of Sugar Chain Binding Mode on Water-soluble Micropatterning Performance and Physical Characteristics	187
<i>Toru Amano, Makoto Kobayashi and Satoshi Takei</i>	
Low Stress and Low Temperature Curable Photosensitive Polyimide	195
<i>Yu Shoji, Keika Hashimoto, Yutaro Koyama, Yuki Masuda, Hitoshi Araki and Masao Tomikawa</i>	
Effect of Cross-linker on Photosensitive Polyimide to Achieve Full Imidization and Lower Stress for Good Reliability	201
<i>Ayaka Azuma, Satoshi Abe and Mamoru Sasaki</i>	
Purification Method for Achieving Low Trace Metals in Ultra-High Purity Chemicals	205
<i>Mitsuaki Kobayashi, Yukihiro Okada, Takaaki Shirai, Osamu Sawajiri, Robert Gieger and Majid Entezarian</i>	
Study on Fabrication of X-ray Collimators by X-ray Lithography Using Synchrotron Radiation	213
<i>Shunya Saegusa, Noriyuki Narukage, Yuichi Utsumi and Akinobu Yamaguchi</i>	

JOURNAL OF PHOTOPOLYMER SCIENCE AND TECHNOLOGY

Volume 34, Number 3, 2021

- Synthesis of Photo-degradable Polyphthalaldehyde Macromonomer and Adhesive Property Changes of its Copolymer with Butyl Acrylate on UV-irradiation 219
Hirokazu Hayashi, Hideki Tachi and Kanji Suyama
- Fabrication of Diffractive Waveplates by Scanning Wave Photopolymerization with Digital Light Processor 225
Hirona Nakamura, Yoshiaki Kobayashi, Megumi Ota, Miho Aizawa, Shoichi Kubo and Atsushi Shishido
- Control of Radical Polymerization and Cationic Polymerization in Photocurable Resin for 3D Printers 231
Kotaro Kobayashi, Hirohumi Takamatsu, Tatsuo Taniguchi, Hiroaki Okamoto and Takashi Karatsu
- Effect of Acrylic and Epoxy Hybrid Crosslinker on the Mechanical Strength of Photocurable Resin for 3D Printing 237
Miharu Ito, Hirofumi Takamatsu, Tatsuo Taniguchi, Hiroaki Okamoto and Takashi Karatsu
- Synthesis and Characterization of High Refractive Index Polythiocyanurates 251
Songyan Shi, Yoshihisa Onodera, Tadashi Tsukamoto, Yuji Shibasaki and Yoshiyuki Oishi
- Preparation and Applications of a Polysilane-allyl Methacrylate Copolymer 255
Fumiya Kato, Yukihito Matsuura, Masanobu Ohikita and Tomoharu Tachikawa
- Novel Effective Photoinitiators for the Production of Dental Fillings 259
Monika Topa and Joanna Ortyl
- Top Thermal Annealing of 2D/3D Lead Halide Perovskites: Anisotropic Photoconductivity and Vertical Gradient of Dimensionality 263
Rei Shimono, Ryosuke Nishikubo, Fumitaka Ishiwari and Akinori Saeki
- Photoinduced Charge Carrier Dynamics of Metal Chalcogenide Semiconductor Quantum Dot Sensitized TiO₂ Film for Photovoltaic Application 271
Safna Ravindi Padmaperuma, Maning Liu, Ryosuke Nakamura and Yasuhiro Tachibana
- Effect of 2-propanol Immersing on Organohalide Perovskite Layer in Perovskite Solar Cells Fabricated by Two-step Method 279
Daiki Okawa, Yoshiyuki Seike and Tatsuo Mori
- Synthesis, Properties, and Photovoltaic Characteristics of Arch- and S-shaped Naphthobisthiadiazole-based Acceptors 285
Seihou Jinnai and Yutaka Ie

Improved Hole-Transporting Properties in Conjugated Polymers Mixed with Polystyrene as an Insulating Polymer	291
<i>Yuya Horiuchi, Koshiro Midori, Hyung Do Kim and Hideo Ohkita</i>	
Evaluation of Color Stability of Experimental Dental Composite Resins Prepared from Bis-EFMA, A Novel Monomer System	297
<i>Ömer Hatipoğlu, Emine Akyüz Turumtay, Ayşegül Göze Saygın and Fatma Pertek Hatipoğlu</i>	
Synthesis and Structure-Activity Relationship of <i>N</i> -Substituted Carbazole Oxime Ester Photoinitiators	307
<i>Huaqiao Lu and Zhiquan Li</i>	
Electrical and Optical Model of Reverse Mode Liquid Crystal Cells with Low Driving Voltage	315
<i>Rumiko Yamaguchi and Koichi Inoue</i>	
Biocompatibility of Different Universal Adhesives During Short and Long Periods on Rat Model	321
<i>Murat ÜNAL, Ayşegül SAYGIN, Tülay KOÇ, Merve CANDAN and İrem İPEK</i>	

JOURNAL OF PHOTOPOLYMER SCIENCE AND TECHNOLOGY

Volume 34, Number 4, 2021

Synthesis of Highly Ordered Si-Containing Fluorinated Block Copolymers	329
<i>Jianuo Zhou, Xuemiao Li and Hai Deng</i>	
Synthesis of Ordered Fluorinated BCPs with One Block Composed of Random Copolymer	335
<i>Min Cao and Hai Deng</i>	
Synthesis of Highly Ordered Fluorinated Copolymers with One Polyhydroxystyrene Block for Subsequent Metal Incorporation	339
<i>Zhenyu Yang and Hai Deng</i>	
Environmental Dependence of Chemiluminescence Using Solvatochromic Molecules	345
<i>Masaki Kayama, Kohei Iritani and Takashi Yamashita</i>	
Analyses of Charge Accumulation of PTzBT Ternary Polymer Solar Cells Using ESR Spectroscopy	351
<i>Dong Xue, Masahiko Saito, Itaru Osaka and Kazuhiro Marumoto</i>	
A Study On Ant Colony Optimization	357
<i>Tomohisa Takimi</i>	
Effect on Suppression of Biofilm Growth using Microstructures Inspired by Living Organism	363
<i>Mariko Miyazaki and Akihiro Miyauchi</i>	
Direct Observation of Gastropod's Locomotion for Soft Robot Application	369
<i>Kazuki Maeda and Fujio Tsumori</i>	
Soft Actuator with DN-gel Dispersed with Magnetic Particles	375
<i>Shutaro Shigetomi and Fujio Tsumori</i>	
Glass Microchannel Formation by Mycelium	381
<i>Daiki Sato and Fujio Tsumori</i>	
Microstructure Formation on Poly (Methyl Methacrylate) Film Using Atmospheric Pressure Low-Temperature Plasma	385
<i>Masashi Yamamoto, Youichiro Mori, Takuya Kumagai, Atsushi Sekiguchi, Hiroko Minami and Hideo Horibe</i>	
Water-Repellency Model of the Water Strider, <i>Aquarius paludum paludum</i> , by the Curved Structure of Leg Micro-Hairs	393
<i>Kaoru Uesugi</i>	

Development of Bile Direct Stent Having Antifouling Properties by Atmospheric Pressure Low-Temperature Plasma	401
<i>Atsushi Sekiguchi, Masashi Yamamoto, Takuya Kumagai, Youichiro Mori, Hiroko Minami, Masayasu Aikawa and Hideo Horibe</i>	
Finite Element Analysis of Advanced Imprint Process to Multilayered Material	411
<i>Kazuki Tokumaru, Tsuyoshi Miyata and Fujio Tsumori</i>	
Petal-like Microstructures Formed from Sterically Crowded Chromophores	417
<i>Yoshiaki Tokumura and Mina Han</i>	

JOURNAL OF PHOTOPOLYMER SCIENCE AND TECHNOLOGY

Volume 34, Number 5, 2021

- Photoluminescence Properties of Copolyimides Containing Naphthalene Core and Analysis of Excitation Energy Transfer between the Dianhydride Moieties423
Marina Doi, Koichiro Muto, Mayuko Nara, Naiqiang Liang, Kosuke Sano, Hiroaki Mori, Ryohei Ishige and Shinji Ando
- Self-assembly of Crosslinked Polyimides Templated by Block Copolymers for Fabrication of Porous Films431
Takahiro Komamura, Yuta Nabae and Teruaki Hayakawa
- Orientation Control of the Microphase-separated Nanostructures of Block Copolymers on Polyimide Substrates439
Hayato Maeda, Yuta Nabae and Teruaki Hayakawa
- Effect of Phase Separation due to Solvent Evaporation on Particle Aggregation in the Skin Layer of the Gas Separation Membrane449
Shiori Higashi, Masafumi Yamato and Hiroyoshi Kawakami
- Thermal Conversion of Polyamic Acid Gel to Polyimide Solution Having Amino Group Sidechains457
Yoshikatsu Shiina, Shohta Ohnuki and Atsushi Morikawa
- Fabrication and Characterizations of Polymer Electrolyte Composite Membranes Consisted of Polymer Nanofiber Framework Bearing Connected Proton Conductive Pathways463
Takahiro Ogura, Kazuto Suzuki, Manabu Tanaka and Hiroyoshi Kawakami
- Temporal Variations of Optical Emission Spectra in Microwave-Excited Plasma in Saturated Water Vapor under Reduced Pressure during Photoresist Removal469
Takuya Kitano, Takeshi Aizawa, Tatsuo Ishijima, Hiroaki Suzuki, Arufua Shiota, Yasunori Tanaka and Yoshihiko Uesugi
- Improved Uniformity of Photoresist Ashing for a Half-Inch Wafer with Double U-shaped Antenna Structure in a Microwave-Excited Water Vapor Plasma479
Takeshi Aizawa, Taishin Shimada, Tasuku Sakurai, Yusuke Nakano, Yasunori Tanaka, Yoshihiko Uesugi and Tatsuo Ishijima
- Effect of pH on Decomposition of Organic Compounds Using Ozone Microbubble Water ...485
Kazuki Tsujimoto and Hideo Horibe
- Improvement of Resist Characteristics by Synthesis of a Novel Dissolution Inhibitor for Chemically Amplified Three-Component Novolac Resist491
Shinya Akechi and Hideo Horibe
- Influence of Glycerol in Developer on Novolac-Type Positive-Tone Resist Solubility495
Shunpei Kajita, Yukiko Miyaji and Hideo Horibe

Removal of Novolac Photoresist with Various Concentrations of Photo-active Compound Using H ₂ /O ₂ Mixtures Activated on a Tungsten Hot-wire Catalyst	499
<i>Koki Akita, Shota Sogo, Ryusei Sogame, Masashi Yamamoto, Shiro Nagaoka, Hironobu Umemoto and Hideo Horibe</i>	
Nodule Deformation on Cleaning of PVA Roller Brushes and its Relation to Cross-contamination	505
<i>Atsuki Hosaka, Tsubasa Miyaki, Yuki Mizushima, Satomi Hamada, Ryota Koshino, Akira Fukunaga and Toshiyuki Sanada</i>	
Birefringent Control of Photo-Oriented Polymeric Films by <i>in situ</i> Exchange of Functional Moieties	511
<i>Yunosuke Norisada, Mizuho Kondo, Tomoyuki Sasaki, Moritsugu Sakamoto, Hiroshi Ono and Nobuhiro Kawatsuki</i>	
Siloxane Oligomer with Random Structure for Use in Photosensitive White Decorative Coatings	517
<i>Mitsuhito Suwa, Toru Okazawa and Hideyuki Kobayashi</i>	
Emission Properties of Hybrid Films of Benzylideneaniline-based Amorphous Molecular Materials with Organic Acids	525
<i>Takuma Tsukada and Hideyuki Nakano</i>	
Synthesis of Amino Acid-derived Curing Reagents Containing a Disulfide Bond and Their Application to Anionic UV Curing Materials	529
<i>Masahiro Furutani, Kako Maeno and Arata Tanaka</i>	
Characterization of Shape of Polymer Nano-Films Possessing Various Crosslinking Chain Length	533
<i>Shin-ichi Kondo, Naoki Doi, Yasushi Sasai, Yukinori Yamauchi and Masayuki Kuzuya</i>	
Viscoelastic Properties of Cholesteric Liquid Crystals from Hydroxypropyl Cellulose Derivatives	537
<i>Yuki Ogiwara, Naoto Iwata and Seiichi Furumi</i>	
Fabrication of Colloidal Crystal Gel Film Using Poly(<i>N</i> -vinylcaprolactam)	543
<i>Takaki Kaneda, Yutaro Seki, Naoto Iwata and Seiichi Furumi</i>	
Synthesis and Optical Properties of Completely Etherified Hydroxypropyl Cellulose Derivatives	549
<i>Yo Baba, Seina Saito, Naoto Iwata and Seiichi Furumi</i>	
Suspensions of Polymer Hydrogel Microparticles with Highly Sensitive Detectability of Glucose	555
<i>Tatsuya Kawa, Yosuke Shibata, Naoto Iwata and Seiichi Furumi</i>	
Protrusion Formation of Polymer Surface by Atomic Hydrogen Annealing	561
<i>Akira Heya and Koji Sumitomo</i>	