

Chemistry Letters

Highlight Review

Coselection of Ruthenium–Polypyridyl Dyes
with Organic Dyes in Dye-sensitized Solar Cells
Yuhiko Kato, Shufang Zhang, Xudong Yang, and
Liyu

Direct Functionalization of Aromatic Rings
on Platinum-loaded Titanium Oxide Photocatalyst
Hayato Yuzawa and Hisao Yoshida*

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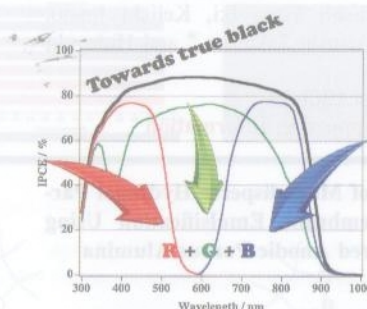
The Chemical Society of Japan

Highlight Review

1328 Cosensitization of Ruthenium–Polypyridyl Dyes with Organic Dyes in Dye-sensitized Solar Cells

Youhei Numata, Shufang Zhang, Xudong Yang, and Liyuan Han*

doi:10.1246/cl.130701

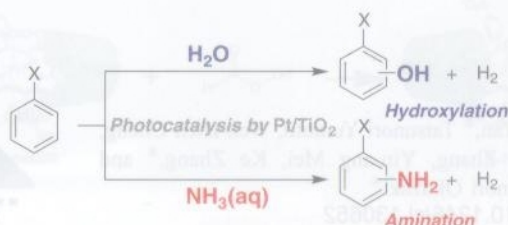


Cosensitization, a technique involving sensitization of a metal-oxide semiconductor electrode with two or more different dyes, is a promising strategy to enhance light-harvesting capabilities of dye-sensitized solar cells. In this review, we introduce recent developments in highly efficient solar cells cosensitized by ruthenium–polypyridyl and organic dyes and design strategies for cosensitizer molecules.

1336 Direct Functionalization of Aromatic Rings on Platinum-loaded Titanium Oxide Photocatalyst

Hayato Yuzawa and Hisao Yoshida*

doi:10.1246/cl.130757



Organic syntheses by using TiO_2 photocatalysts have been extensively studied in view of green and sustainable chemistry. In this highlight review, we describe our recent studies on photocatalytic direct functionalization of aromatic ring, i.e., aromatic ring hydroxylation with H_2O and aromatic ring amination with aqueous NH_3 on Pt-loaded TiO_2 photocatalysts. Both reactions involve two key steps: one is an activation of a rather stable molecule (H_2O or NH_3) by a photoexcited hole on TiO_2 to produce its radical species, and the other is an aromatic substitution by the radical species through the addition–elimination mechanism. Interestingly, the radical species produced from H_2O (surface oxygen radical or hydroxyl radical) is electrophilic while that produced from NH_3 (amide radical) is electroneutral. These properties determine the regioselectivity in the functionalization of substituted benzene.

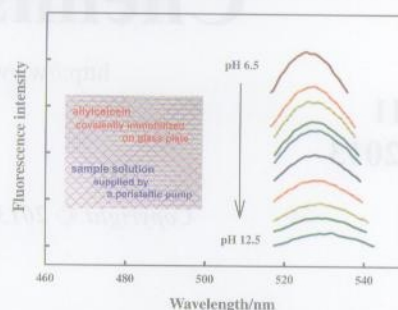
Letter

1344 A Fluorescent Sensor Based on Covalently Immobilized Allylcalcein for Determining pH

Pinzhu Qin* and Dawei Huang

doi:10.1246/cl.130620

Electronic Supporting Information

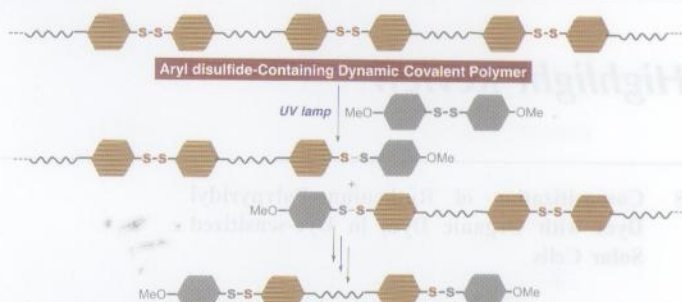


1346 Insertion Metathesis Depolymerization of Aromatic Disulfide-containing Dynamic Covalent Polymers under Weak Intensity Photoirradiation

Tomoyuki Ohishi, Yoko Iki, Keiichi Imato, Yuji Higaki, Atsushi Takahara,* and Hideyuki Otsuka*

doi:10.1246/cl.130639

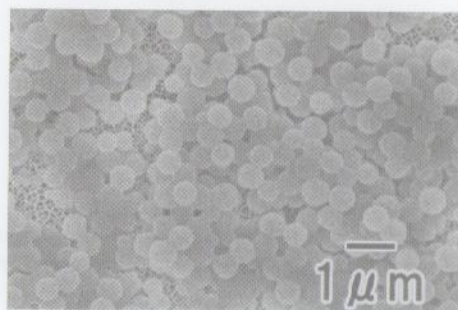
Electronic Supporting Information



1349 Preparation of Monodisperse Hydrogel Particles by Membrane Emulsification Using Highly Ordered Anodic Porous Alumina

Takashi Yanagishita, Midori Kawamoto, Kazuyuki Nishio, and Hideki Masuda*

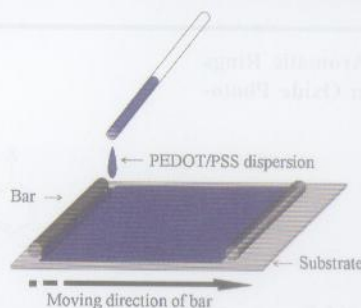
doi:10.1246/cl.130655



1352 Thin Films of PEDOT/PSS Bar-coated on Transparent Plastic Substrates

Hu Yan,* Tatsunori Yumoto, Wen-zhen Cheng, Ping Zhang, Yin-ang Mei, Ke Zhang,* and Hidenori Okuzaki*

doi:10.1246/cl.130652



We have investigated on highly conductive and transparent thin films of PEDOT/PSS bar-coated on transparent plastic substrates such as PC and PET sheets. Sheet resistance, transmittance at wavelength of 550 nm, and surface roughness of obtained high-performance transparent sheets of PEDOT/PSS/PET were 383 Ω/sq, 75%, and 1.8 nm, respectively.

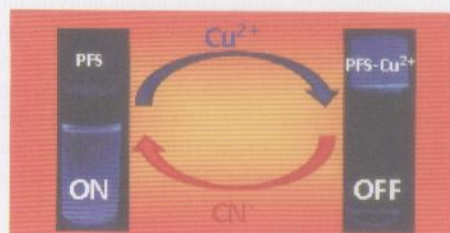
1355 Conjugated Polyfluorene-based Reversible Fluorescent Sensor for Cu(II) and Cyanide Ions in Aqueous Medium

Chanchal Chakraborty, Pradeep Singh, Samir K. Maji, and Sudip Malik*

doi:10.1246/cl.130630

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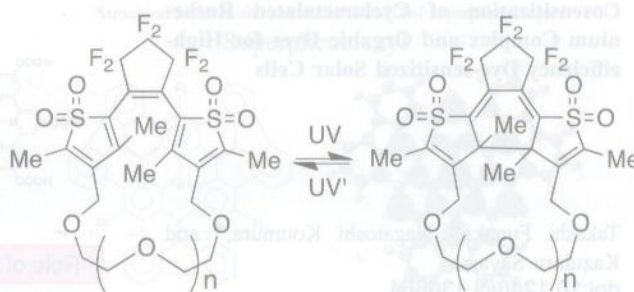
The sensing behavior of rationally designed polyfluorene copolymer is reported. It detects reversibly copper ions and cyanide ions via fluorescence TURN OFF–TURN ON mechanism with a low detection limit.



1358 Syntheses and Photochromic Properties of Thiophenophan-1-ene-*S,S,S',S'*-tetraoxides

Michinori Takeshita,* Tomohiro Kodama, Yuta Wada, and Natsumi Hachō
doi:10.1246/cl.130638

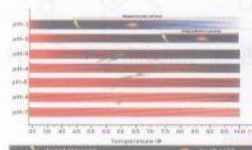
[Electronic Supporting Information](#)



1360 PMMA-based Stimuli-responsive Flexible Thin-films

Roshan Jesus Mathew, Sarika Raj, and Ravi Shankaran Dhesingh*
doi:10.1246/cl.130708

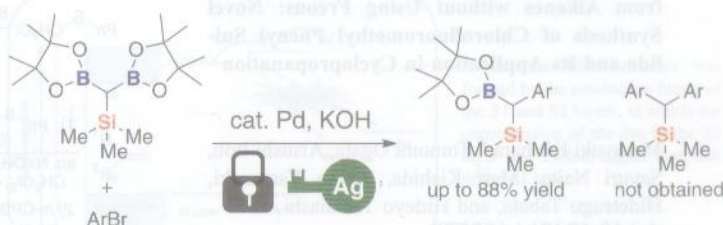
Low-cost and flexible thin-films exhibiting stimuli-responsive properties were fabricated by labeling poly(methyl methacrylate) (PMMA) with Congo red diazo dye. The flexibility and transparency of the films enable them to be used on any surfaces. Their multistimuli-responsive properties, namely thermochromic and pH-responsive abilities, were analyzed and confirmed by stability studies of Congo red dye-labeled PMMA thin-films. The properties of the fabricated material make it promising for use in multistimuli-responsive sensors in various applications such as food preservation, water treatment, and environmental analysis.



1363 Silver(I) Oxide-promoted Chemoselective Cross-coupling Reaction of (Diborylmethyl)-trimethylsilane

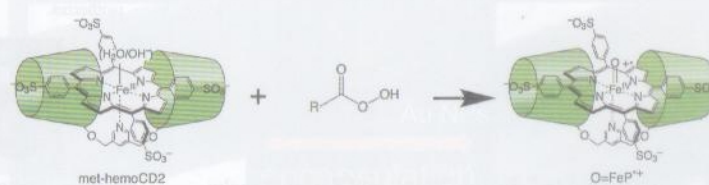
Kohei Endo,* Fumiya Kurosawa, and Yutaka Ukaji
doi:10.1246/cl.130643

[Electronic Supporting Information](#)

1366 Intramolecular Oxidative *O*-Demethylation in a Per-*O*-methylated β -Cyclodextrin-Iron Porphyrin Inclusion Complex in Aqueous Solution

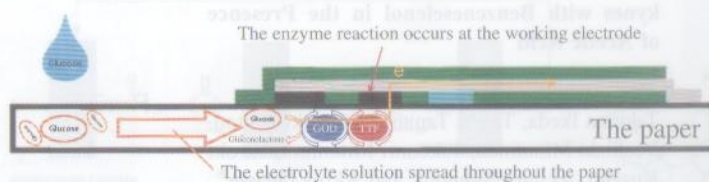
Takunori Ueda, Saki Kumeda, Hiroaki Kitagishi, and Koji Kano*
doi:10.1246/cl.130678

[Electronic Supporting Information](#)



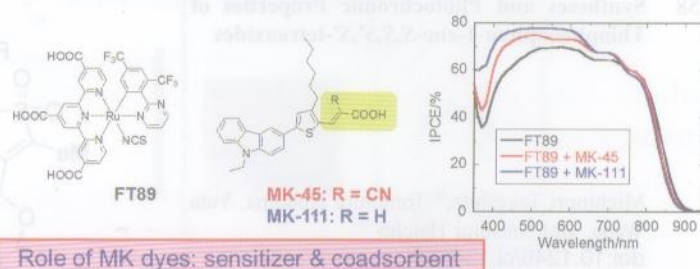
1369 Fully Screen-printed Paper-based Electrode Chip for Glucose Detection

Isao Shitanda,* Tasuku Yamaguchi, Yoshinao Hoshi, and Masayuki Itagaki
doi:10.1246/cl.130681



- 1371 **Cosensitization of Cyclometalated Ruthenium Complex and Organic Dyes for High-efficiency Dye-sensitized Solar Cells**

Takashi Funaki,* Nagatoshi Koumura,* and Kazuhiro Sayama
doi:10.1246/cl.130664

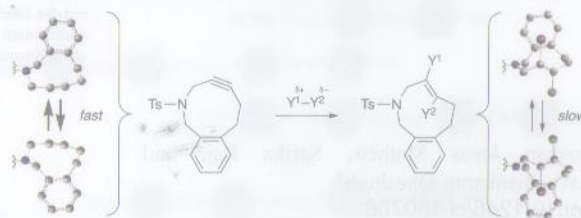


- 1374 **Synthesis, Structural Analysis, and Reaction of 3-Aza-5-[7]orthocyclophynes**

Kazunobu Igawa, Takeshi Kawabata, Runyan Ni, and Katsuhiko Tomooka*
doi:10.1246/cl.130735

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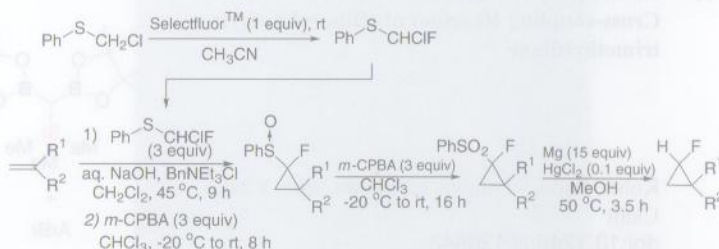
A newly synthesized 3-aza-5-[7]orthocyclophynes shows labile planar chirality at ambient temperature. Its halogenation reaction efficiently affords well-functionalized 3-aza-5-[7]orthocyclophenes with stable planar chirality.



- 1377 **Synthesis of Monofluoromethylcyclopropanes from Alkenes without Using Freons: Novel Synthesis of Chlorofluoromethyl Phenyl Sulfide and Its Application in Cyclopropanation**

Masayuki Kiriha,* Tomomi Ogata, Atsushi Ito, Sayuri Naito, Mari Kishida, Kento Yamazaki, Hidetsugu Tabata, and Hideyo Takahashi
doi:10.1246/cl.130570

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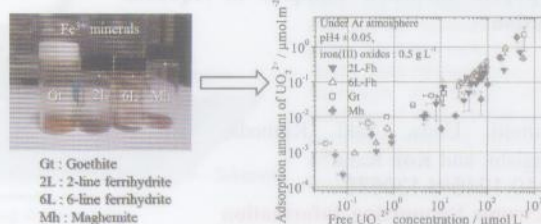


- 1380 **Comparison of Uranyl Adsorption on Iron(III) Oxyhydroxide Colloids**

Keigo Niida,* Takumi Saito, and Satoru Tanaka
doi:10.1246/cl.130589

Electronic Supporting Information

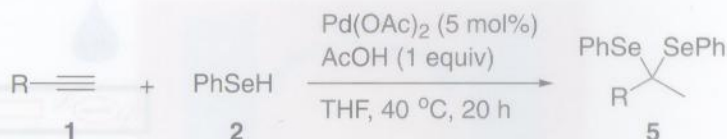
The adsorption of UO_2^{2+} on the four iron(III) (oxy)hydroxides, 2-line ferrihydrite, 6-line ferrihydrite, goethite, and maghemite, were investigated by comparing the adsorption isotherms.



- 1383 **Highly Regioselective Palladium-catalyzed Double Hydroselenation of Terminal Alkynes with Benzeneselenenol in the Presence of Acetic Acid**

Takuma Ikeda, Taichi Tamai, Masayuki Daitou, Yoshiaki Minamida, Takenori Mitamura, Hiroki Kusano, Akihiro Nomoto, and Akiya Ogawa*
doi:10.1246/cl.130641

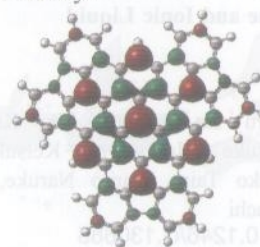
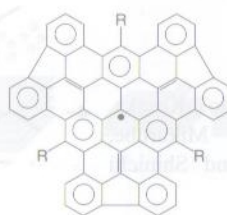
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1386 Superphenalenyl: Theoretical Design of a π -Conjugated Planar Hydrocarbon Radical

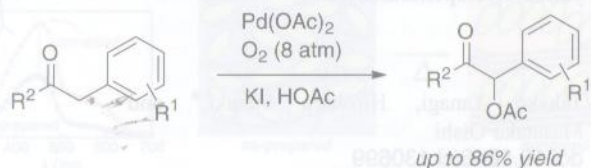
Structural formula and calculated SOMO of superphenalenyl.

Superphenalenyl



Yasuhiro Ikabata, Kin-ya Akiba, and Hiromi Nakai*

doi:10.1246/cl.130679

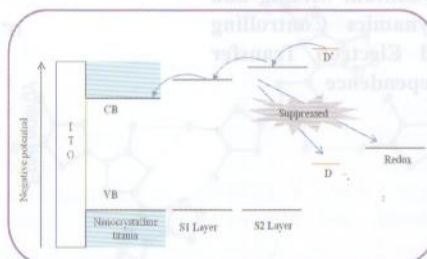
1388 Palladium-catalyzed Oxidation of Benzyl Ketones to Synthesis of α -Acetoxy Ketones Using Molecular OxygenAn efficient procedure for the preparation of α -acetoxy ketone derivatives by palladium-catalyzed with O_2 as the sole oxidant have been reported. A variety of benzyl ketones were used to investigate the scope of the reactions.

Zheng-Wang Chen,* Dong-Nai Ye, Min Ye, and Liang-Xian Liu*

doi:10.1246/cl.130694

Electronic Supporting Information

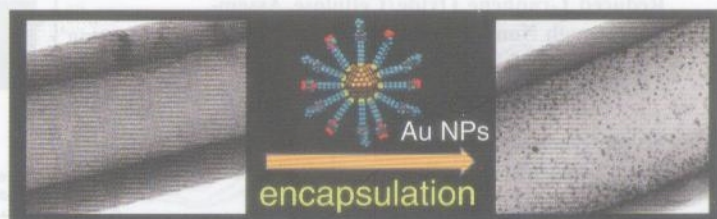
1391 Photoelectric Conversion Properties of Compositionally Graded Dye–Titania Electrode



A step-like band structure was formed by the conduction bands of the S1 and S2 layers, in which the concentration of the dye in the S2 layer was 10-fold higher than that of the S1 layer.

Rudi Agus Setiawan, Hiromasa Nishikiori,* Nobuaki Tanaka, and Tsuneo Fujii
doi:10.1246/cl.130647

1394 Synthesis of Anionic Sulfonate-functionalized Conducting Polymer Nanotubes and Selective Confinement of Cationic Gold Nanoparticles in Their Inner Cavities via Electrostatic Interaction

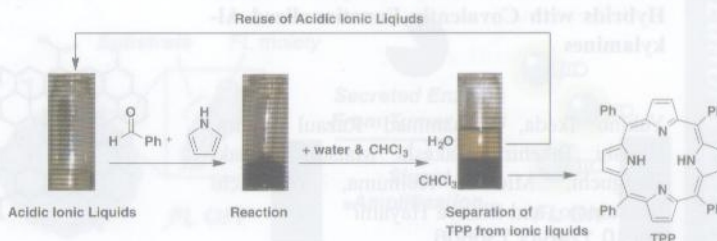


Nobuyuki Fujimoto, Tsukasa Nakahodo, and Hisashi Fujihara*

doi:10.1246/cl.130692

Electronic Supporting Information

1397 Porphyrin Preparation in Acidic Ionic Liquids

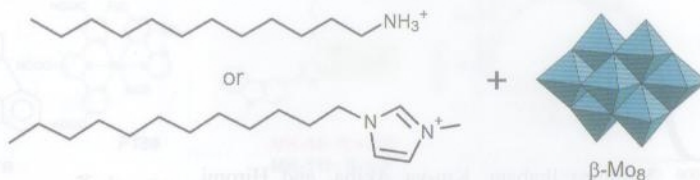


Satoshi Kitaoka,* Kaoru Nobuoka, Ryoki Hirakawa, Keita Ihara, and Yuichi Ishikawa

doi:10.1246/cl.130662

1400 **Polyoxomolybdate-Surfactant Layered Crystals Derived from Long-tailed Alkylamine and Ionic Liquid**

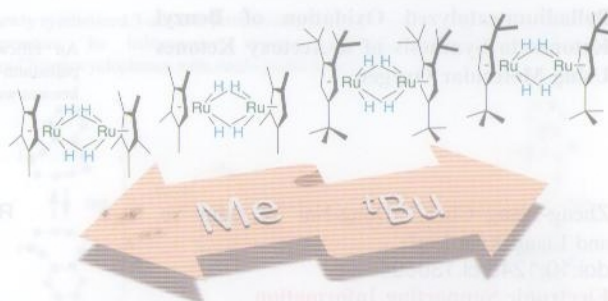
Takeru Ito,* Ryuta Ide, Kurato Kosaka, Shinsuke Hasegawa, Keisuke Mikurube, Minako Taira, Haruo Naruke, and Shinichi Koguchi
doi:10.1246/cl.130683



1403 **Synthesis and Properties of Diruthenium Tetrahydrides Supported by Less-substituted, Sterically Demanding Poly-*tert*-butylated Cyclopentadienyls**

Takako Yanagi, Hiroharu Suzuki,* and Masataka Oishi
doi:10.1246/cl.130699

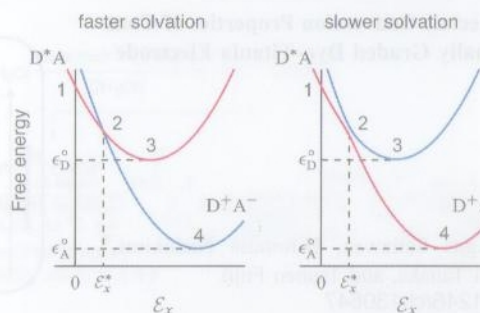
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1406 **Interactions between Quantum Mixing and the Environmental Dynamics Controlling Ultrafast Photoinduced Electron Transfer and Its Temperature Dependence**

Akihito Ishizaki
doi:10.1246/cl.130608

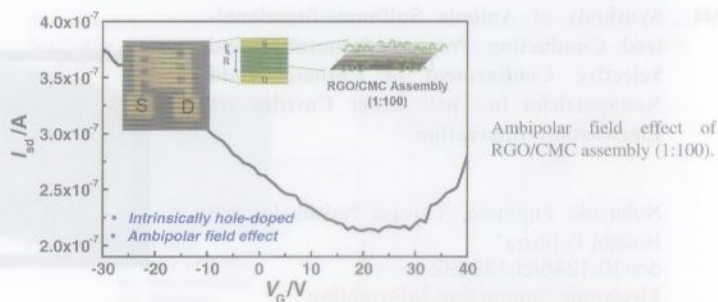
Electronic Supporting Information



1409 **Formation of Semiconducting Chemically Reduced Graphene Oxide/Cellulose Assembly through Noncovalent Interactions**

Seong-Gyoun Ha, Young-Ju Yeon, Seonho Jung, Young Ho Park, Byoungnam Park,* and Insik In*
doi:10.1246/cl.130648

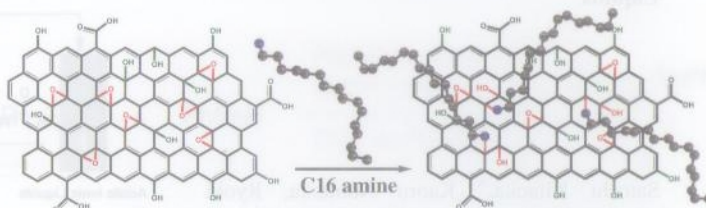
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1412 **Proton Conductivity of Graphene Oxide Hybrids with Covalently Functionalized Alkylamines**

Yukino Ikeda, Mohammad Razaul Karim, Hiroshi Takehira, Takeshi Matsui, Takaaki Taniguchi, Michio Koinuma, Yasumichi Matsumoto, and Shinya Hayami*
doi:10.1246/cl.130606

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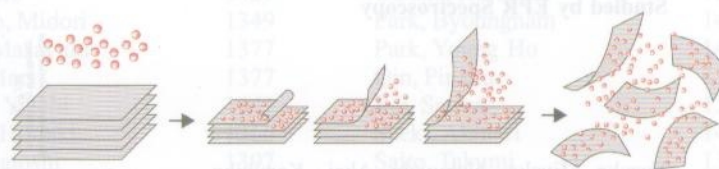


- 1415 **Solid Exfoliation of Hexagonal Boron Nitride Crystals for the Synthesis of Few-layer Boron Nitride Nanosheets**

Lin Liu, Zhitao Xiong, Daqiang Hu, Guotao Wu, Bin Liu, and Ping Chen*

doi:10.1246/cl.130562

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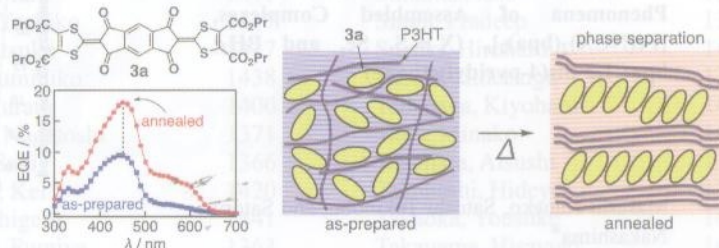


- 1417 **Tetrathiafulvalene Hybridized with Indacenete-traone as Visible-light-harvesting Electron Acceptor Applicable to Bulk-heterojunction Organic Photovoltaics**

Kouki Akaike, Hideo Enozawa,* Takashi Kajitani, Mari Koizumi, Atsuko Kosaka, Daisuke Hashizume, Yoshiko Koizumi, Akinori Saeki, Shu Seki, and Takanori Fukushima*

doi:10.1246/cl.130702

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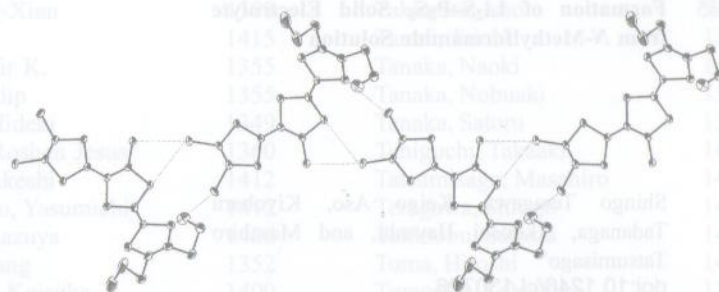


- 1420 **Zigzag Arrangement of Bromo-substituted 2,5-Di(1,3-dithiol-2-ylidene)-1,3-dithiolane-4-thione Derivatives and Their Physical Properties**

Kazumasa Ueda,* Kei Kunitomo, Kousuke Henmi, Keiko Miyabayashi, and Kenji Yoza

doi:10.1246/cl.130704

Electronic Supporting Information



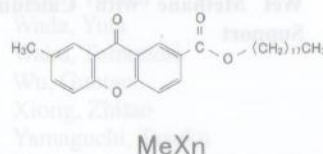
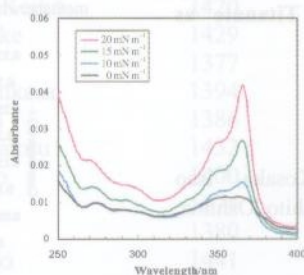
- 1423 **Sharp J-Bands Observed for Xanthone Derivatives in Langmuir and Langmuir-Blodgett Films**

Michio Kobayashi,* Hitoshi Toma, Tetsuo Akutsu, Kazuhide Araki, Hisayuki Takayama, and Toshihiko Hoshi

doi:10.1246/cl.130577

Electronic Supporting Information

The surface pressure dependence of the electronic absorption spectra for MeXn in the L film.

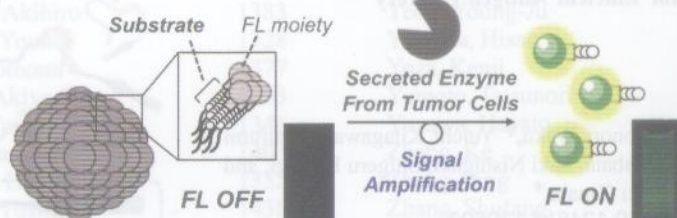


- 1426 **Disassembly-driven Turn-on Sensing of Enzyme Activity by Substrate-based Fluorescent Nanoprobe**

Yousuke Takaoka, Yoshiaki Fukuyama, Kazuya Matsuo, and Itaru Hamachi*

doi:10.1246/cl.130697

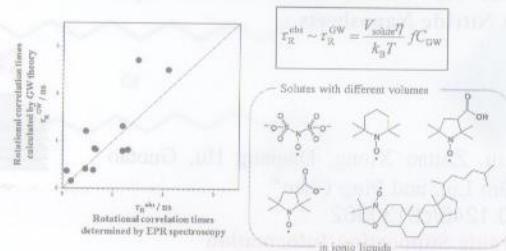
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1429 **Solute Size-dependent Rotational Diffusion of Nitroxide Radicals in Ionic Liquids as Studied by EPR Spectroscopy**

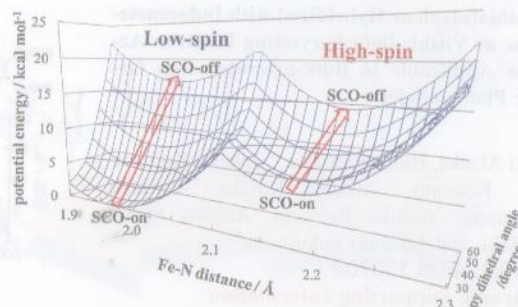
Yusuke Miyake, Nobuyuki Akai, Kazuhiko Shibuya, and Akio Kawai*
doi:10.1246/cl.130682

Gierer–Wirtz theory for rotational diffusion of solutes in ionic liquids well explains the results with wide range of solute volume.



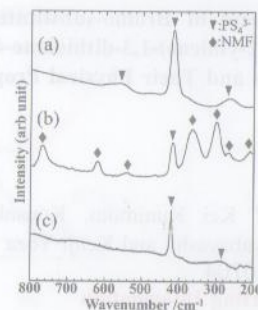
1432 **Density Functional Study on Spin-crossover Phenomena of Assembled Complexes, [Fe(NCX)₂(bpa)₂]_n (X = S, Se, and BH₃; bpa: 1,2-bis(4-pyridyl)ethane)**

Masashi Kaneko, Satoshi Tokinobu, and Satoru Nakashima*
doi:10.1246/cl.130712



1435 **Formation of Li₂S–P₂S₅ Solid Electrolyte from *N*-Methylformamide Solution**

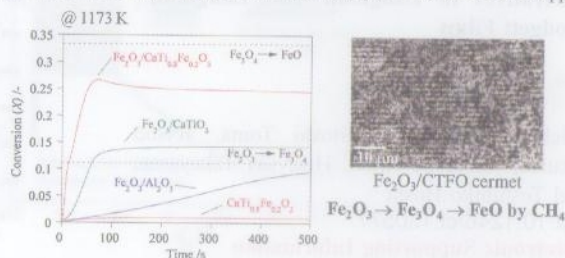
Shingo Teragawa, Keigo Aso, Kiyoharu Tadanaga, Akitoshi Hayashi, and Masahiro Tatsumisago*
doi:10.1246/cl.130726



1438 **Acceleration of Fe₂O₃ Reduction Kinetics by Wet Methane with Calcium Titanate as Support**

Syunsuke Isogai, Fumihiko Kosaka, Isao Takimoto, Hiroyuki Hatano, Yoshito Oshima, and Junichiro Otomo*
doi:10.1246/cl.130624

Fe₂O₃ reduction kinetics and lattice oxygen utilization are significantly improved in wet methane when an oxide ion conductor, CaTi_{1-x}Fe_xO_{3-δ} (CTFO), is used as a support.



1441 **Self-assembled β -Sheet Peptide Nanofibers for Efficient Antigen Delivery**

Tomonori Waku,* Yuichi Kitagawa, Kazufumi Kawabata, Saki Nishigaki, Shigeru Kunugi, and Naoki Tanaka*
doi:10.1246/cl.130693

Electronic Supporting Information

