Highlight Review

1226 Tailoring Material Properties through Defect Engineering

Harry L. Tuller* and Sean R. Bishop
doi:10.1246/cl.2010.1226

Many advanced materials today derive their function from precise control of point defects. Through manipulation of point defects, the electrical, optical, mechanical, and other properties of materials can be systematically modified and optimized. This feature paper illustrates the type of progress that has been made in understanding the often complex equilibria exhibited by many materials and shows, by use of examples, how this knowledge can be applied to tailor materials' properties through defect engineering. Examples which highlight key points of defect engineering include: dark conductivity of radiation detectors, chemomechanics and nanionics of solid oxide fuel cell materials, sensitivity of high frequency resonators for high-temperature mass measurements, and emission lifetime and luminescence intensity of phosphor materials.

1232 Recent Progress in Living Cationic Polymerization of Vinyl Ethers

Arihiro Kanazawa, Shokyoku Kanaoka, and Sadahito Aoshima*
doi:10.1246/cl.2010.1232
1238 **Timing-controlled Decompaction of Polyplexes In Vivo Greatly Enhances Transgene Expression**

Yoichi Tachibana, Tomoko Hashimoto, Hisae Nozaki, Akira Murakami, and Tetsuji Yamaoka

doi:10.1246/cl.2010.1238

1240 **Prevention of Adsorption of Fluorescent Amino Acids to Gels by Using a Peptide Containing Dendritic Amino Acids**

Mizuki Kitamatsu,* Kazumasa Akagi, and Masahiko Sisido

doi:10.1246/cl.2010.1240

**Electronic Supporting Information**

1242 **Phase Transition and Thermal Behavior Change of Low Silica X Zeolite at [Al] = 90**

Mana Yasmu-Hiraia, Teruhisa Hongo,* Hiroko Hayashi, Tetsuo Takaishi, Shinichi Nataka, and Atsushi Yamazaki

doi:10.1246/cl.2010.1242

**Electronic Supporting Information**

1245 **Sialyglycan-modified Field Effect Transistor for Detection of Charged Lectin under Physiological Conditions**

Takahiro Nakamura, Yoshihiro Sakurai, Sho Hideshima, Shigeki Kuroiwa, and Tetsuya Osaka,*

doi:10.1246/cl.2010.1245

**Electronic Supporting Information**

1248 **Synthesis and Metal-like Luster of Novel Polyaniline Analogs Containing Azobenzene Unit**

Minoru Kukino, Junpei Kawabora, Kiyoto Matsuishi, Takashi Fukuda, and Takaki Kanbara,*

doi:10.1246/cl.2010.1248

**Electronic Supporting Information**
1251 Lignin Gasification over Charcoal-supported Palladium and Nickel Bimetal Catalysts in Supercritical Water

Aritomo Yamaguchi, Norihito Hiyoshi, Osamu Sato, Mitsumasa Osada, and Masayuki Shirai*
doi:10.1246/cl.2010.1251

Electronic Supporting Information

The mixture of Pd(NH3)4(NO3)2/C and Ni(NO3)2/C is more active for the lignin gasification than the individual monometal catalysts. EXAFS and XRD show the formation of small Pd-Ni alloy particles, which are the active sites for the lignin gasification.

1254 Modified OligoDNA Having Two Consecutive Silylated-pyrene Moieties in Minor Groove Exhibiting an Excimer Fluorescent Signal upon Binding to Fully Complementary DNA Strand

Mika Mogi, Md. Gias Uddin, Mayumi Ichimura, Tomohisa Moriguchi, and Kazuo Shinozuka*
doi:10.1246/cl.2010.1254

Electronic Supporting Information

OligoDNA possessing consecutive modified nucleotide residues bearing silylated pyrene molecule at C-2′ position exhibited marked excimer fluorescent signal upon binding to the fully matched complementary DNA strand.

1256 Water-soluble Inclusion Complexes of [60]Fullerene Derivatives Using γ-Cyclo-dextrin

Atsushi Ikeda,* Tomoya Genmoto, Naotake Maekubo, Jun-ichi Kikuchi, Motofusa Akiyama, Takayuki Mochizuki, Shuhei Kotani, and Toshifumi Konishi
doi:10.1246/cl.2010.1256

Electronic Supporting Information

1258 One-step Preparation of Gold Nanoparticles Using 4-Acylamidobenzenethiol as a Reductive Stabilizer

Hiroaki Okamura,* Junichi Kurawaki, Tetsuo Iwagawa, Toshiyuki Hamada, and Masatake Kawashima
doi:10.1246/cl.2010.1258

Electronic Supporting Information

1261 Triazole-linked Benzylated Glucosyl, Galactosyl, and Mannosyl Monomers and Dimers as Novel Sugar Scaffold-based PTP1B Inhibitors

Yin-Jie Zhang, Xiao-Peng He, Cui Li, Zhen Li, De-Tai Shi, Li-Xin Gao, Bei-Ying Qiu, Xiao-Xin Shi, Yun Tang,* Jia Li,* and Guo-Rong Chen*
doi:10.1246/cl.2010.1261

Electronic Supporting Information

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http://www.csj.jp/journals/chem-lett/
1264 Solid-state Thermal and Photochemical E/Z Isomerization of Bidentate-N,S Schiff Base Ligands in Iridium(III) Complexes

The complete thermal and photochemical switching processes have been observed at a C=N double bond in a Schiff base IrIII complex derived from 2-substituted benzothiazoline.

Tatsuya Kawamoto,* Yusuke Takino, Keiichi Sakoda, and Takumi Konno
doi:10.1246/cl.2010.1264
Electronic Supporting Information

1267 The First Experimental Demonstration of Side Chain Extension of Geoporphyrins in Sediments

A high carbon number geoporphyrin

Kenta Asahina, Junya Asano, Gen Kumagai, Mitsuru Satou, Kouichi Nomoto, Yuichiro Kashiyama, Hajime Mita, and Shinya Nomoto*
doi:10.1246/cl.2010.1267

1270 The Synthesis and Flame Retardance of a High Phosphorus-containing Unsaturated Polyester Resin

A high phosphorus-containing unsaturated polyester resin (P-UPR) with UL94 V-0 rate was synthesized by a one-step or two-step method with a low amount of 15.0 wt % dimethyl methylphosphonate (DMMP) as a reactive flame retardant.

Chen Zhang, Shu-Mei Liu,* Jun-Yi Huang, and Jian-Qing Zhao
doi:10.1246/cl.2010.1270

1273 Dynamic Response of a Cholesterol-containing Model Membrane to Oxidative Stress

Tsuyoshi Yoda, Mun’delanji C. Vestergaard, Yoko Akazawa-Ogawa, Yasukazu Yoshida, Tsutomu Hamada,* and Masahiro Takagi
doi:10.1246/cl.2010.1273

1275 AFM Interaction Study of Poly(ammonium acrylate) Adsorbed on a Si Surface in Aqueous KCl Solution

Force curve of the PAA on the Si substrate in the KCl solution. Short- and long-range interactions were explained, respectively, by steric hindrance of the polymer adsorbed onto the solid surface and DLVO theory.

Toshitiro Isobe,* Yosuke Nakano, Yoshikazu Kameshima, Kiyoshi Okada, and Akira Nakajima
doi:10.1246/cl.2010.1275
1277 MCM-41 Grafted Quaternary Ammonium Salts as Recyclable Catalysts for the Sequential Synthesis of Dimethyl Carbonate from Epoxides, CO₂, and Methanol

Jian Li, Liguo Wang, Shimin Lü, Xue Li, Feng Shi,* and Youquan Deng*
doi:10.1246/cl.2010.1277
Electronic Supporting Information

One kind of novel heterogenous bifunctional catalysts, MCM-41 grafted quaternary ammonium salts with terminal amino groups was prepared for the first time. These catalysts exhibited excellent catalytic performance and good reusability in the sequential synthesis of dimethyl carbonate from epoxides, CO₂, and methanol.

1279 Oxidation of Dihydrazone of Diaryl α-Diketones to Diarylacetylenes Using Sodium Periodate

Balaram S. Takale and Vikas N. Telvekar*
doi:10.1246/cl.2010.1279
Electronic Supporting Information

1281 Synthesis of ^13C-Labeled 5,6,11-Trideoxytetrodotoxin

Taiki Umezawa, Tetsuro Shinada,* and Yasufumi Ohfune*
doi:10.1246/cl.2010.1281
Electronic Supporting Information

R = 4α-OH: ^13C-5,6,11-trideoxytetrodotoxin
R = 4β-OH: ^13C-4-epi-5,6,11-trideoxytetrodotoxin

1283 Beat of Frequency Modes with an Artificial Negative Frequency in Spectrogram Analysis

Atsushi Yabushita,* Chih-Hsien Kao, Yu-Hsien Lee, and Takayoshi Kobayashi
doi:10.1246/cl.2010.1283
Electronic Supporting Information

Artifact caused by negative frequency mode on spectrogram.

1285 Nanoaggregate Formation of Amphiphilic Alternating and Random Copolyimides in Water

Takashi Hamada and Kazuaki Kudo*
doi:10.1246/cl.2010.1285
Electronic Supporting Information
1288  **Band Gap and Absorption Profile Change by Changing Molecular Weight and Conformation of Water-soluble Narrow-band-gap Polymers**  

Hiroyuki Aota,* Takeshi Ishikawa, Yuta Amiuchi, Hirofumi Yano, Tatsuya Kunimoto, and Akira Matsumoto  
doi:10.1246/cl.2010.1288  
Electronic Supporting Information

Band gaps and absorption profiles of water-soluble π-conjugated polymers, which were prepared by the addition-condensation of pyrrole with sodium α-formylbenzenesulfonate, changed with changing their molecular weights and conformations in different solvents. The band gaps were changed from less than 0.19 eV in a solid to 0.59 eV in a solution.

1291  **Clustering of Lipid Rafts in Plasma Membranes by Hybrid Liposomes for Leukemia Cells along with Apoptosis**  

Yuji Komizu, Sayuri Nakata, Koichi Goto, Yoko Matsumoto, and Ryuichi Ueoka*  
doi:10.1246/cl.2010.1291

Hybrid liposomes (HL-23) composed of 90 mol % 1-α-dimyristoylphosphatidylycholine (DMPC) and 10 mol % polyoxyethylene(23) dodecyl ether (C12(EO)23) could induce the clustering of lipid rafts in the plasma membranes for human leukemia HL-60 cells leading to apoptosis.

1294  **Self-generated Motion of Droplets Induced by Korteweg Force**  

Takahiko Ban,* Ai Aoyama, and Takuya Matsumoto  
doi:10.1246/cl.2010.1294

Unidirectional motion of a droplet in aqueous Na2SO4/PEG two-phase system.

1297  **Blocking Oxidation of Al Surfaces with Organic Thiol Monolayers Cured by Electron Beam**  

Shuhei Nomura, Taro Yamada,* and Maki Kawai  
doi:10.1246/cl.2010.1297  
Electronic Supporting Information

1300  **Fluoro-substituted Phenyleneethylenes: Acetylenic n-Type Organic Semiconductors**  

Daisuke Matsuo, Xin Yang, Akiko Hamada, Kyo Morimoto, Takaji Kato, Masayuki Yahiro, Chihaya Adachi,* Akihiro Orita,* and Junzo Otera*  
doi:10.1246/cl.2010.1300  
Electronic Supporting Information

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http://www.csj.jp/journals/chem-lett/
1303 Thermal Properties of Alkali (Fluorosulfonyl)(trifluoromethylsulfonyl)amides

Keigo Kubota, Toshiyuki Nohira, Rika Hagiwara, and Hajime Matsumoto*
doi:10.1246/cl.2010.1303

1305 Magnetic Resonance-visible Coating for Endovascular Device Visualization: Gadolinium-(III)–Diethylenetriaminepentaacetic Acid-based Insoluble Polymer Coating

Tomoka Kurita,* Kagayaki Kuroda, and Takeo Ohsaka
doi:10.1246/cl.2010.1305

1307 Development of a Flux Stabilizer for Solid-state Nuclear Magnetic Resonance with a Hybrid Magnet

Kenjiro Hashi,* Tadashi Shimizu, Teruaki Fujito, Atsushi Goto, Shinobu Ohtki, Toshihisa Asano, Shigeki Nimori, Giyuu Kido, and Jun Kida
doi:10.1246/cl.2010.1307

1309 Fabrication of Novel Reflective–Emissive Dual-mode Display Cell Based on Electrochemical Reaction

Yuichi Watanabe, Kazuki Nakamura, and Norihisa Kobayashi*
doi:10.1246/cl.2010.1309

1312 Silicalite Pervaporation Membrane Exhibiting a Separation Factor of over 400 for Butanol

Hideyuki Negishi,* Keiji Sakaki, and Toru Ikeyama
doi:10.1246/cl.2010.1312
1315 Robust Hole Transport in a Thienothiophene Derivative toward Low-cost Electronics

Shinya Oku, Kazuhiro Takamiya, Daisuke Adachi, Shuhei Ishikawa, Shuichi Nagamatsu, Wataru Takashima,* Shuzi Hayase, and Keiichi Kaneto
doi:10.1246/cl.2010.1315
Electronic Supporting Information

1317 Rapid Adsorption of Rh(III) by Polyamine-functionalized Cellulose Fiber Combined with Microwave Irradiation

Ahmed M. Yousif, Masateru Nishioka, Yoshito Waku, and Toshishige M. Suzuki*
doi:10.1246/cl.2010.1317
Electronic Supporting Information

1319 Catalytic Beckmann Rearrangement of Cyclooctadecanone Oxime

Satoshi Sato,* Hideaki Hoshino, Tsunemi Sugimoto, and Kohichi Kashiwagi
doi:10.1246/cl.2010.1319

1321 Guest Binding, Cellular Uptake, and Molecular Delivery of Water-soluble Cyclophanes Having a Pyrene Moiety

Osamu Hayashida,* Chika Eguchi, Keiichiro Kimura, Yu Oyama, Tomomi Nakashima, and Kosei Shioji
doi:10.1246/cl.2010.1321
Electronic Supporting Information

1323 Hybrid Inorganic–Organic Crystals Composed of Octamolybdate Isomers and Pyridinium Surfactant

Takeru Ito,* Keisuke Mikurube, Yukihiro Abe, Takahisa Koroki, Masaki Saito, Jun Iijima, Hario Naruke, and Tomoji Ozeki*
doi:10.1246/cl.2010.1323
Electronic Supporting Information
Crystallized thin TiO$_2$ films were successfully prepared via the high-pressure crystallization (HPC) process. Comparing to conventional heating process, the crystallized temperature for thin TiO$_2$ films was significantly decreased. The IPCE values of the crystallized films were significantly increased by the UV-irradiation after the HPC treatment.

1326 Thin TiO$_2$ Films Prepared via High-pressure Crystallization for Dye-sensitized Solar Cells

Jeng-Shin Ma and Chung-Hsin Lu*
doi:10.1246/cl.2010.1326

1329 Synthesis and Gelation Behavior of 4′-Propyl-1,1′-bi(cyclohexyl)-4-one 4-Alkoxylanzenzoaldehyde hydrone

A series of new alkoxybenzoylhydrazones of 4′-propyl-1,1′-bi(cyclohexyl)-4-one were prepared as novel low molecular weight organogelators (LMOGs). Their gelation behaviors in 10 solvents were tested.

Juan Li, Pei Chen,* Xinbing Chen, Zhongwei An, and Yan Li
doi:10.1246/cl.2010.1329

1331 Ferromagnetic Gd–Cu, Tb–Cu, and Ho–Cu Couplings in Isomorphous [Ln$_2$Cu] Complexes

Atsushi Okazawa, Ryo Watanabe, Masaru Nezu, Takashi Shimada, Shunsuke Yoshii, Hiroyuki Nojiri,* and Takayuki Ishida* doi:10.1246/cl.2010.1331

Electronic Supporting Information

Preparation of Thin CuInSe$_2$ Films Using Cu–In Alloy Nanoparticles

Cu–In alloy nanoparticles were successfully synthesized via the chemical reduction method. The selenization of the obtained alloy nanoparticles coated on the substrates was demonstrated to be a potential route to prepare monophasic thin CuInSe$_2$ films with large grains.

Shih-Hsien Liu, Fu-Shan Chen, and Chung-Hsin Lu*
doi:10.1246/cl.2010.1333