

# BULLETIN OF THE CHEMICAL SOCIETY OF JAPAN

<http://www.csj.jp/journals/bcsj/>

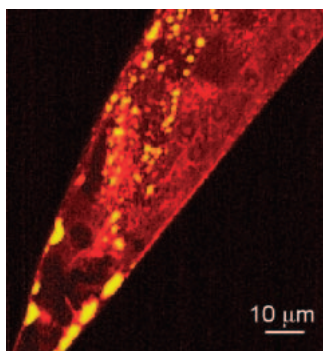
Volume 83, Number 7, July 2010

## Award Accounts

The Chemical Society of Japan Award for Young Chemists for 2007

### Molecular Spectroscopic Imaging Using a White-Light Laser Source

H. Kano



A coherent anti-Stokes Raman scattering (CARS) microspectroscopic system is developed using a white-light laser source. Label-free and multi-color molecular spectroscopic imaging is performed through a multiplex CARS process.

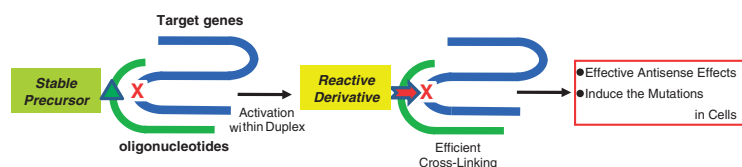
*Bull. Chem. Soc. Jpn.* **2010**, *83*, 735–743

## Accounts

### Synthesis of Reactive Oligonucleotides for Gene Targeting and Their Application to Gene Expression Regulation

F. Nagatsugi\* and S. Sasaki

Synthetic oligodeoxynucleotides (ODNs) are valuable tools to interfere with gene expression. This review summarizes reactive ODNs with inducible reactivity, especially, efficient cross-linking reactions that have been developed by the author's group.

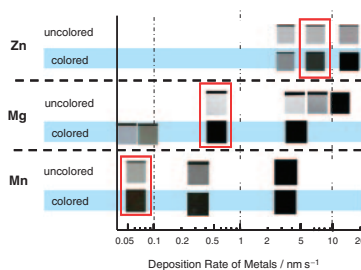


*Bull. Chem. Soc. Jpn.* **2010**, *83*, 744–755

## BCSJ Award Article

### Light-Controlled Selective Metal Deposition on a Photochromic Diarylethene Film—Toward New Applications in Electronics and Photonics—

Y. Sesumi, S. Yokojima, S. Nakamura, K. Uchida, and T. Tsujioka\*



Selective metal deposition for Zn, Mg, and Mn on the diarylethene film was achieved by adjusting deposition rate. Fine metal patterns were produced by laser scanning and maskless vacuum-evaporation.

*Bull. Chem. Soc. Jpn.* **2010**, *83*, 756–761

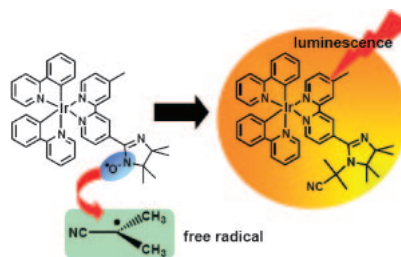
### Selected Paper

#### A Novel Free Radical Probe Based on a Preluminescent Iridium Complex Bearing a Nitronyl Radical Moiety

H. Yoshikawa,\* M. Kobayashi,  
T. Takahashi, and K. Awaga\*

*Bull. Chem. Soc. Jpn.* **2010**, *83*,  
762–766

A novel iridium complex with an iminonitroxide bipyridine ligand was prepared as a preluminescent probe to detect free radicals. The nitroxide radical in the molecule traps free radicals, and its luminescence is enhanced, depending on the amounts of free radicals.



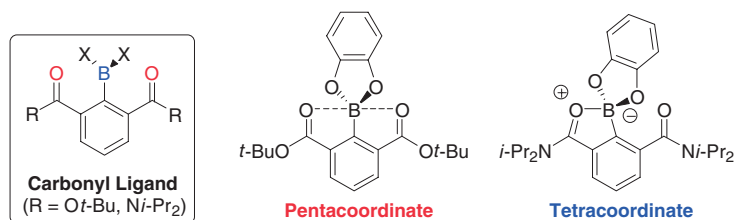
### Selected Paper

#### Synthesis and Structure of Boron Compounds Bearing Tridentate Ligands with 1,3-Bicarboxylbenzene Skeleton

J. Nakatsuji and Y. Yamamoto\*

*Bull. Chem. Soc. Jpn.* **2010**, *83*,  
767–776

Organoboron compounds bearing ester and amide tridentate ligands were prepared and characterized by X-ray analysis. In these series, the coordination state and the degree of the B–O interaction depend on the substituents on the central boron atom and the ligands.

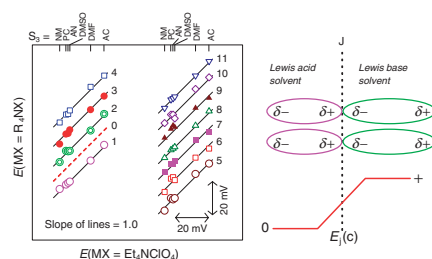


#### Liquid Junction Potential between Different Solvents: The Component due to Solvent–Solvent Interactions Is Dipole Potential in Nature

K. Izutsu

*Bull. Chem. Soc. Jpn.* **2010**, *83*,  
777–781

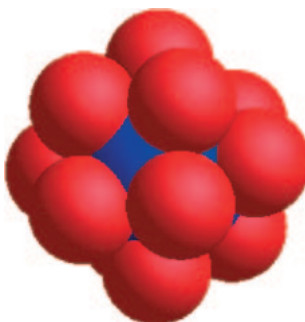
Among the three components of the liquid junction potential between different solvents, the component due to solvent–solvent interactions is a dipole potential. The left shows its electrolyte-independence and the right a model for it.



#### Atomic Radii for Depicting Atoms in a Molecule: Cu in Inert Gas Matrix

T. Naka, Y. Hatano, S. Yamamoto,  
T. Noro, and H. Tatewaki\*

*Bull. Chem. Soc. Jpn.* **2010**, *83*,  
782–787



The charge distribution of the Cu atom in the Ne matrix is drawn by the use of the present atomic radii. The Cu charge distribution overlaps those of the Ne atoms, indicating that Cu is strongly perturbed with Ne's.

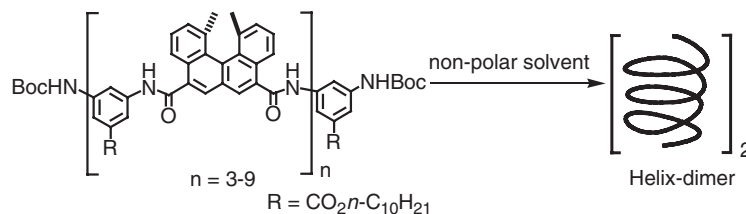


### Synthesis and Thermally Stable Helix-Dimer Formation of Amido-helicene Oligomers

R. Amemiya, W. Ichinose, and M. Yamaguchi\*

*Bull. Chem. Soc. Jpn.* **2010**, *83*, 809–815

Amidooligomers containing three to nine optically active helicene units were synthesized by a two-directional method. The CD spectra and VPO studies revealed that they formed thermally stable helix-dimer structure in non-polar solvents, while random-coil in hydrogen-bonding breaking solvents.

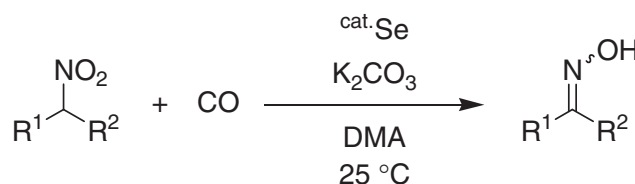


### Selenium-Catalyzed Deoxygenative Reduction of Aliphatic Nitro Compounds with Carbon Monoxide

Y. Nishiyama,\* S. Ikeda, H. Nishida, and R. Umeda

*Bull. Chem. Soc. Jpn.* **2010**, *83*, 816–818

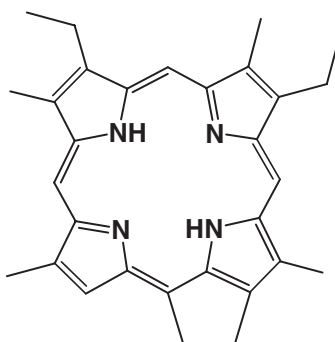
It was found that aliphatic nitro compounds were reduced by carbon monoxide in the presence of a selenium catalyst under mild conditions to give the corresponding oximes in moderate to good yields.



### Total Synthesis of 17-nor-Deoxophylloerythroetioporphyrin

S. Nomoto,\* J. Asano, K. Asahina, H. Mita, and Y. Kashiyaama

*Bull. Chem. Soc. Jpn.* **2010**, *83*, 819–821



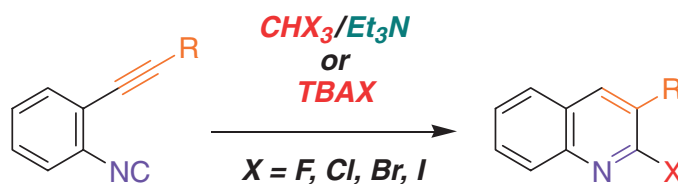
Synthesis of 17-nor-deoxophylloerythroetioporphyrin, a sedimentary nor-porphyrin, was performed through a bilene-*b* route in a reasonable total yield. The porphyrin prepared here can potentially be used as a biological marker for chlorophyll *c*-producing algae.

### Synthesis of 2-Halogenated Quinolines by Halide-Mediated Intramolecular Cyclization of *o*-Alkynylaryl Isocyanides

T. Mitamura, A. Nomoto, M. Sonoda, and A. Ogawa\*

*Bull. Chem. Soc. Jpn.* **2010**, *83*, 822–824

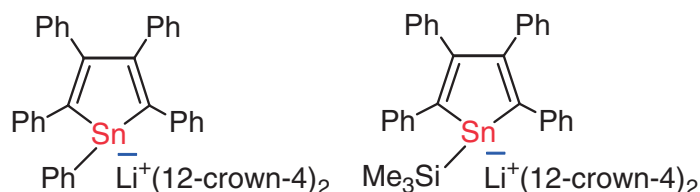
When *o*-alkynylaryl isocyanides are treated with sources of halide ions such as fluoride, chloride, bromide, and iodide ions, the intramolecular halogenating cyclization of isocyanides takes place, affording the corresponding 2-halogenated quinoline derivatives in good to excellent yields, selectively.



### Synthesis and Structures of Lithium Salts of Stannole Anions

M. Saito,\* T. Kuwabara, K. Ishimura, and S. Nagase

1-Lithio-1-phenyl- and 1-lithio-1-trimethylsilylstannoles were synthesized and the corresponding lithium salts of stannole anions were characterized by X-ray diffraction analysis. The five-membered rings of the two lithium salts are planar with remarkable alternation of the C–C bonds, suggesting that they are both non-aromatic. Theoretical calculations are also carried out to discuss their electronic nature.

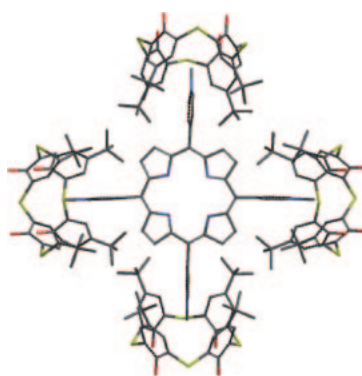


*Bull. Chem. Soc. Jpn.* **2010**, *83*, 825–827

### Tetra(*p*-*t*-butyl)thiacalix[4]arenetetrol Forms 4:1 Complex with Tetrakis(1-methyl-4-pyridinio)porphyrin

K. Hirakawa\* and H. Segawa\*

Tetra(*p*-*t*-butyl)thiacalix[4]arenetetrol formed 4:1 complexes with water-soluble cationic porphyrin, tetrakis(1-methyl-4-pyridinio)porphyrin, in dichloromethane phase.

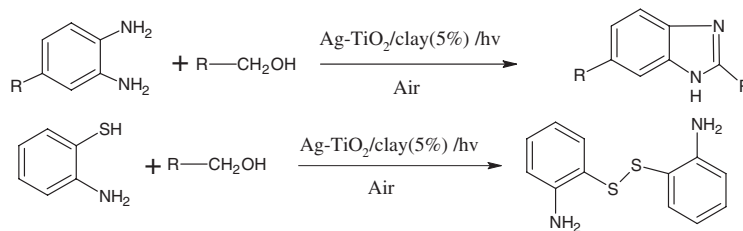


*Bull. Chem. Soc. Jpn.* **2010**, *83*, 828–830

### Ag–TiO<sub>2</sub>/Clay Composite Photocatalyst for the Oxidation–Cyclization of 1,2-Diamine Compounds with Propylene Glycol or Alcohols

K. Selvam, M. Annadhasan, R. Velmurugan, and M. Swaminathan\*

Ag–TiO<sub>2</sub>/clay composite catalyst was applied for the photocatalytic conversion of 1,2-diamines to benzimidazoles with various alcohols in acetonitrile. 2-Aminothiophenol with primary alcohols forms only disulfide and hence this catalyst can be used as a green catalyst for disulfide synthesis.

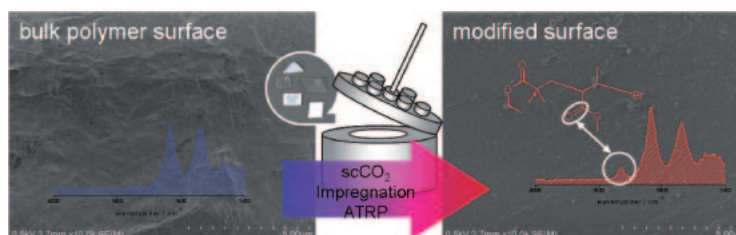


*Bull. Chem. Soc. Jpn.* **2010**, *83*, 831–837

### Living Radical Polymerizations in Supercritical CO<sub>2</sub>-Swollen Fluorinated Polymer Substrates

T. Arita,\* T. Yoshimura, and T. Adschiri

Living radical polymerizations in supercritical CO<sub>2</sub>-swollen fluorinated polymer substrates were investigated. The surface modification by interpenetration between synthesized polymer and fluorinated polymer chains has high functionality. That is, the extension of the penetrated polymer chain was possible.



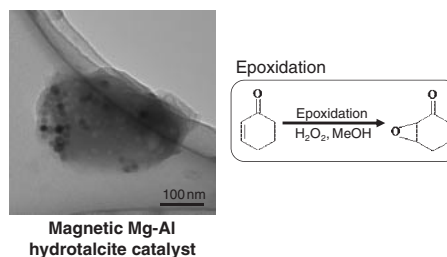
*Bull. Chem. Soc. Jpn.* **2010**, *83*, 838–845

**Monodisperse Iron Oxide Nanoparticles Embedded in Mg–Al Hydrotalcite as a Highly Active, Magnetically Separable, and Recyclable Solid Base Catalyst**

S. Nishimura, A. Takagaki, and K. Ebitani\*

*Bull. Chem. Soc. Jpn.* **2010**, *83*, 846–851

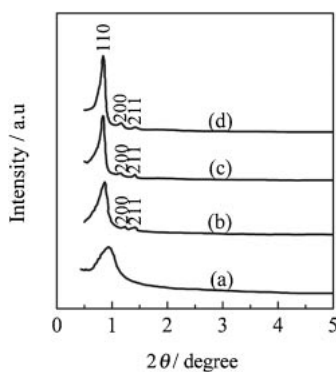
The composite hydrotalcite catalyst prepared by titration method using monodispersed magnetic iron oxide exhibited superparamagnetic behavior, high activity, magnetic separability, and recyclability for the epoxidation of 2-cyclohexen-1-one using hydrogen peroxide.



**Rapid Synthesis of Mesoporous SBA-16 Silica in Weakly Acidic Media**

H. Wang,\* C. Han, H. Pu, L. Zhang, Z. Zou, and Y. Luo\*

*Bull. Chem. Soc. Jpn.* **2010**, *83*, 852–854



Ordered SBA-16 mesoporous silicas with *Im3m* symmetry have been rapidly synthesized under weak acidic conditions in the presence of phosphomolybdic acid and inorganic salts. The aforementioned materials were characterized by XRD,  $N_2$  adsorption–desorption, and TG-DTA.