

# BULLETIN OF THE CHEMICAL SOCIETY OF JAPAN

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

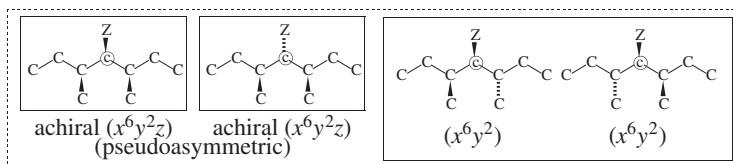
Volume 83, Number 1, January 2010

## Accounts

### Numbers of Alkanes and Monosubstituted Alkanes. A Long-Standing Interdisciplinary Problem over 130 Years

S. Fujita

Enumeration of alkanes and monosubstituted alkanes with given carbon contents, which has been continuously investigated by chemists and mathematicians over 130 years, has been solved recently in agreement with stereochemical and mathematical requirements. Historical backgrounds of the problem and our contributions are reviewed from a viewpoint of a direct interdisciplinary linkage between chemistry and mathematics.



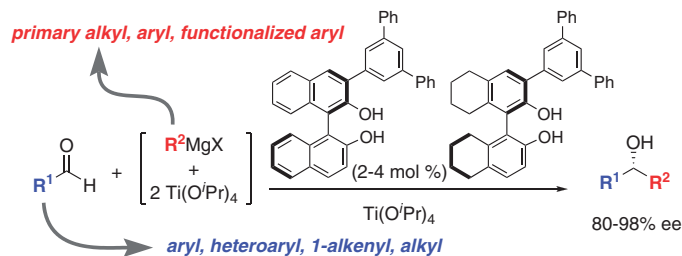
*Bull. Chem. Soc. Jpn.* **2010**, *83*, 1–18

## BCSJ Award Article

### Catalytic Enantioselective Alkylation and Arylation of Aldehydes by Using Grignard Reagents

Y. Muramatsu, S. Kanehira, M. Tanigawa, Y. Miyawaki, and T. Harada\*

Grignard reagents can be used in enantioselective alkylation and arylation of aldehydes by using chiral titanium(IV) catalysts in the presence of titanium tetraisopropoxide. The reaction proceeds with a low catalyst loading, exhibiting high enantioselectivity for various Grignard reagents and aldehydes.

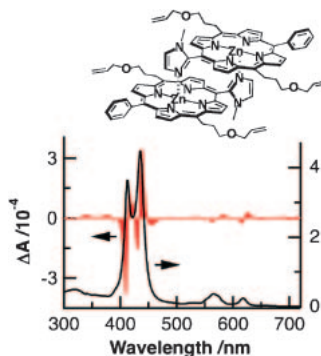


*Bull. Chem. Soc. Jpn.* **2010**, *83*, 19–32

## Selected Paper

### Electroabsorption and Electrophotoluminescence Spectra of Porphyrin Supramolecules in a Polymer Film

T. Nakabayashi, T. Yotsutsuji, K. Ogawa,\* Y. Kobuke, and N. Ohta\*



Electroabsorption (E-A) and electrophotoluminescence (E-PL) spectra of supramolecular porphyrin dimers in a PMMA polymer film have been observed. Two small bands embedded in the complicated absorption spectra in the Soret band region are clearly separated by analyzing the E-A spectra.

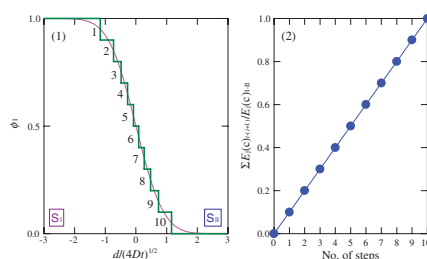
*Bull. Chem. Soc. Jpn.* **2010**, *83*, 33–38

### Liquid Junction Potential between Electrolyte Solutions in Different Solvents: Some Consideration on the Component Due to Solvent–Solvent Interactions

K. Izutsu

*Bull. Chem. Soc. Jpn.* **2010**, *83*, 39–41

Though the two solvents at a junction forms a transition layer (violet curve), the component of the liquid junction potential which is due to the solvent–solvent interaction behaves as if the two solvents interact each other directly.

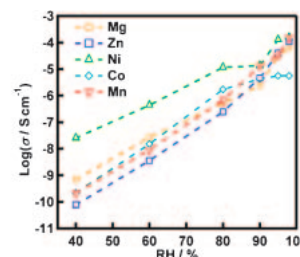
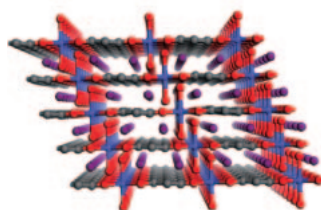


### Structures and Proton Conductivity of One-Dimensional M(dhbq)·nH<sub>2</sub>O (M = Mg, Mn, Co, Ni, and Zn, H<sub>2</sub>(dhbq) = 2,5-Dihydroxy-1,4-benzoquinone) Promoted by Connected Hydrogen-Bond Networks with Absorbed Water

T. Yamada,\* S. Morikawa, and H. Kitagawa\*

*Bull. Chem. Soc. Jpn.* **2010**, *83*, 42–48

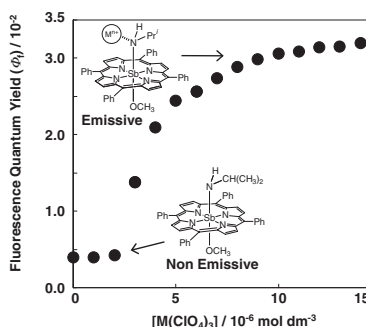
We prepared five metal–dhbq compounds, and evaluated their crystal structures and water absorption properties. Mg, Co, and Ni compounds are found to contain more than two water molecules. Their proton conductivities reach up to  $10^{-4} \text{ S cm}^{-1}$ .



### Amino(porphyrinato)antimony(V) Complexes as a Fluorosensor for Selective and Sensitive Detection of Trivalent Metal Cations

S. Tsunami, H. Fujiwara, J. Matsumoto, T. Shiragami,\* and M. Yasuda

*Bull. Chem. Soc. Jpn.* **2010**, *83*, 49–51



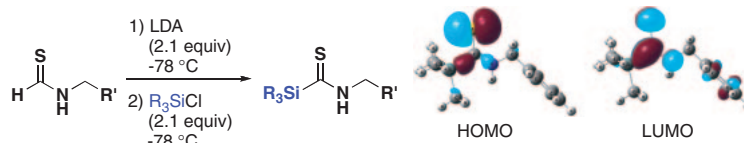
Isopropylamino(methoxy)(tetraphenylporphyrinato)antimony(V) bromide works as a selective and sensitive fluorosensor for detecting trivalent metal cations such as  $\text{Al}^{3+}$ ,  $\text{Ga}^{3+}$ ,  $\text{In}^{3+}$ , and  $\text{Lu}^{3+}$  using partially charge-shifted process.

### Synthesis and Properties of Secondary Thiocarbamoylsilanes

T. Murai\* and R. Hori

*Bull. Chem. Soc. Jpn.* **2010**, *83*, 52–57

The reaction of secondary thioformamides with LDA and  $\text{Me}_3\text{SiCl}$  gave secondary thiocarbamoylsilanes. The reaction was applicable to *N*-primary alkylthioformamides. The reaction involves reverse Brook rearrangement. DFT calculations of the starting thioformamide and the product are also carried out.



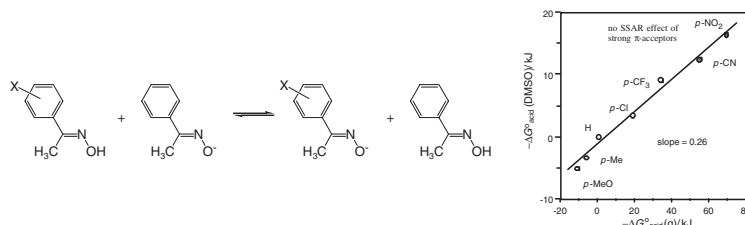
## Selected Paper

### Gas-Phase Acidities of Acetophenone Oximes. Substituent Effect and Solvent Effects

M. M. R. Badal and M. Mishima\*

*Bull. Chem. Soc. Jpn.* **2010**, *83*, 58–65

The substituent effect on the gas-phase acidity of acetophenone oxime was characterized by a large  $\pi$ -delocalization into the aromatic system. Solvent effects on the acidity were analyzed based on the gas-phase acidity.

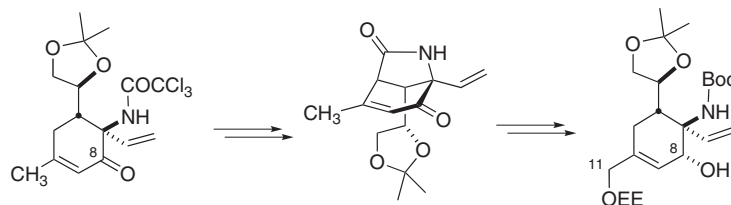


### Synthesis of an Advanced Intermediate Bearing Two Hydroxy Groups for (–)-Tetrodotoxin and Its Analogs

T. Nishikawa,\* Y. Koide, M. Adachi, and M. Isobe\*

*Bull. Chem. Soc. Jpn.* **2010**, *83*, 66–68

A new intermediate for tetrodotoxin and its analogs was synthesized from a bicyclic lactam intermediate, which was prepared from a known enone compound by a novel neighboring group participation as a key step.

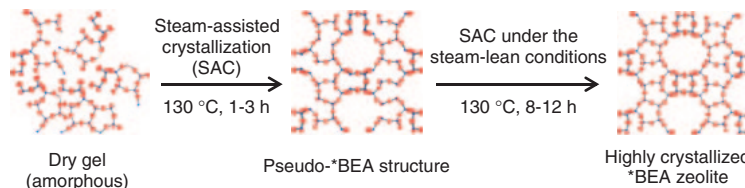


### Effect of Steam on the Steam-Assisted Crystallization of \*BEA-Type Zeolite

S. Inagaki, K. Nakatsuyama, E. Kikuchi, and M. Matsukata\*

*Bull. Chem. Soc. Jpn.* **2010**, *83*, 69–74

Highly crystallized \*BEA nanocrystals with a diameter of around 30 nm can be obtained by short steam-assisted crystallization followed by steam-lean crystallization of the aluminosilicate dry gel containing TEA<sup>+</sup> cations.

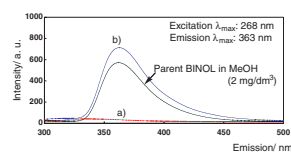
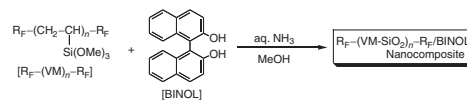


### Preparation of Novel Fluoroalkyl End-Capped Trimethoxyvinylsilane Oligomeric Nanoparticle-Encapsulated Binaphthol: Encapsulated Binaphthol Remaining Thermally Stable Even at 800 °C

H. Sawada,\* Y. Matsuki, Y. Goto, S. Kodama, M. Sugiyama, and Y. Nishiyama

*Bull. Chem. Soc. Jpn.* **2010**, *83*, 75–81

$R_F-(VM-SiO_2)_n-R_F$ -encapsulated BINOL nanocomposite afforded no weight loss behavior corresponding to the presence of BINOL in the composite at 800 °C.  $R_F-(VM-SiO_2)_n-R_F$ /BINOL nanocomposite was unable to show the fluorescence peaks before calcination process; however, this nanocomposite can exhibit a similar fluorescence peak to that of the parent BINOL after calcination.

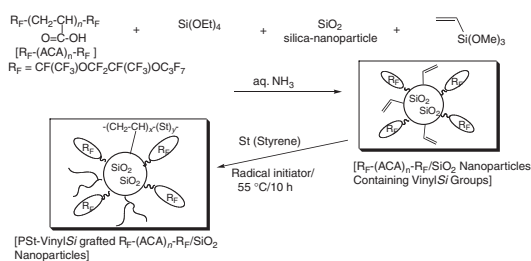


**Surface Functionalization of Fluoroalkyl End-Capped Oligomer/Silica Nanocomposites via Graft Polymerization: Application to the Dispersion of Fullerene and Single-Walled Carbon Nanotubes in Water with These Nanocomposites**

H. Sawada,\* Y. Goto, and T. Narumi

*Bull. Chem. Soc. Jpn.* **2010**, *83*, 82–91

PSt-VinylSi grafted  $R_F-(ACA)_n-R_F/SiO_2$  nanoparticles are applicable to a new fluorinated polysoap and are able to disperse fullerene and single-walled carbon nanotubes into water, effectively.

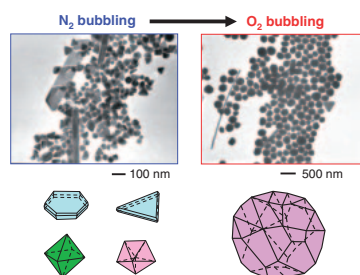


■ **Selected Paper**

**Shape Changes from Polygonal Gold Nanocrystals to Spherical Nanoparticles Induced by Bubbling  $N_2$  or  $O_2$  Gas in Polyol Synthesis of Gold Nanostructures**

M. J. Alam, M. Tsuji,\* and M. Matsunaga

*Bull. Chem. Soc. Jpn.* **2010**, *83*, 92–100



Small gold polygonal nanoparticles prepared in the polyol method could be converted to monodispersed spherical particles under bubbling  $N_2$  or Ar at  $150\text{ }^\circ\text{C}$ . The conversion from polygonal particles to spherical ones was more rapid under bubbling  $O_2$ .