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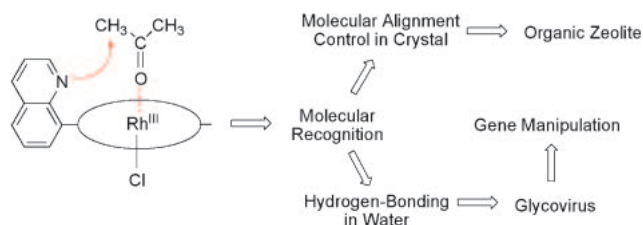
Award Accounts

The Chemical Society of Japan Award for 2006

Structure and Function of Molecular Assembly. A Personal Reminiscence

Y. Aoyama

In this account is reviewed the outline of the author's research work over the last 35 years, covering small host-guest systems in apolar organic media, infinite solid systems, huge but finite nano systems in aqueous media, and manipulated biological systems.



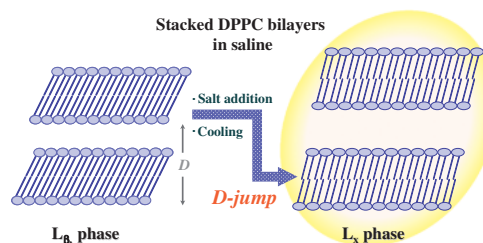
Bull. Chem. Soc. Jpn. **2009**, *82*, 419–438

BCSJ Award Article

Phase Separation of Phosphatidylcholine–Water Systems below the Main Transition Temperature Induced by Monovalent Ions

K. Fukada* and N. Miki

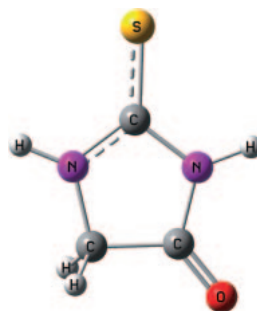
A new phase transition of DPPC bilayers accompanied by a jump in lamellar repeating distance (D) was found for the first time by adding a large amount of 1:1 electrolyte in aqueous medium.



Bull. Chem. Soc. Jpn. **2009**, *82*, 439–445

Proton-Transfer Mechanism in 2-Thioxoimidazolidin-4-one: A Competition between Keto/Enol and Thione/Thiol Tautomerism Reactions

S. Bagheri and H. Roohi*



The direct and water-assisted proton-transfer mechanisms in 2-thioxoimidazolidin-4-one (1,3-IM) via two keto/enol and thione/thiol mechanisms were investigated by using DFT (B3LYP) and ab initio (MP2) methods in the gas phase.

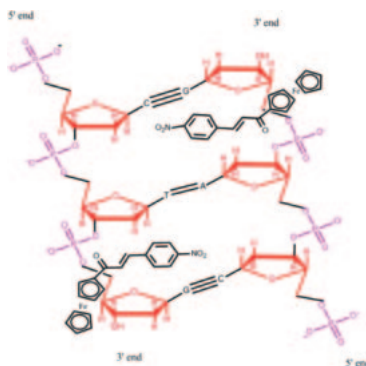
Bull. Chem. Soc. Jpn. **2009**, *82*, 446–452

2-thioxoimidazolidin-4-one (1,3-IM)

Determination of Binding Parameters and Mode of Ferrocenyl Chalcone–DNA Interaction

A. Shah, R. Qureshi,* A. M. Khan,
F. L. Ansari, and S. Ahmad

Bull. Chem. Soc. Jpn. **2009**, *82*,
453–457



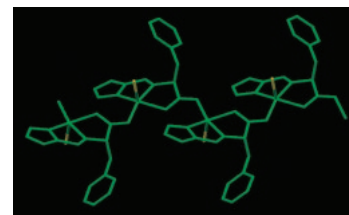
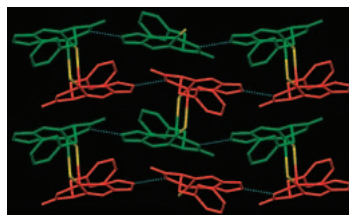
The planar 4-nitrophenyl-2-propen-1-one part of 1-ferrocenyl-3-(4-nitrophenyl)-2-propen-1-one intercalates into the base-stacking domain of DNA double helix and the non planar ferrocenyl group fits into the grooves of DNA.

Enantioselective Assembly Structures of Copper(II) and Zinc(II) Complexes with the 1:1 Condensation Products of Imidazole-4-carbaldehyde Derivatives and DL-Phenylalanine

T. Iihoshi, T. Sato, M. Towatari,
N. Matsumoto,* and M. Kojima

Bull. Chem. Soc. Jpn. **2009**, *82*,
458–466

Copper(II) and zinc(II) complexes with the tridentate ligands of 1:1 condensation products of DL-phenylalanine and imidazole-4-carbaldehyde derivatives (imidazole-4-carbaldehyde, 2-methylimidazole-4-carbaldehyde, and 5-methylimidazole-4-carbaldehyde) were prepared. They assumed homochiral chain structures constructed by intrachain imidazole–carboxylato hydrogen bonds or by intermolecular coordination bonds.

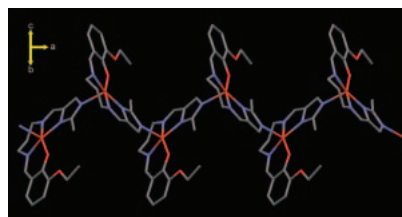


A Ferromagnetic Chain of Imidazolato-Bridged One-Dimensional Copper(II) Complex

T. Yoshida, M. Towatari, T. Sato,
N. Matsumoto,* N. Re, and J. Mrozinski

Bull. Chem. Soc. Jpn. **2009**, *82*,
467–471

[2-Ethoxy-6-{[3-(2-methyl-4-imidazolylmethyleneamino)propyl]iminomethyl}-phenolato]copper(II) perchlorate [CuHL]ClO₄ and its deprotonated complex [CuL]_n were prepared. The structure of [CuHL]ClO₄ has a square-planar coordination geometry, while that of [CuL]_n assumes an imidazolato-bridged zigzag-chain structure. The magnetic data demonstrate that [CuL]_n is a ferromagnetic chain.



Photochemical Modulation of Europium Ion Fluorescence Using a Tetraazamacrocyclic Derivative Bearing a Spirobenzopyran and Three Carboxymethyl Moieties

K. Machitani, Y. Nakahara, and K. Kimura*

Bull. Chem. Soc. Jpn. **2009**, *82*,
472–474

The fluorescence properties of a Eu³⁺ complex with a tetraazamacrocyclic derivative bearing a spirobenzopyran and three carboxymethyl moieties were investigated. The enhanced fluorescence of Eu³⁺, which proved that the spirobenzopyran moiety worked as an antenna for the sensitization, was controlled photochemically.

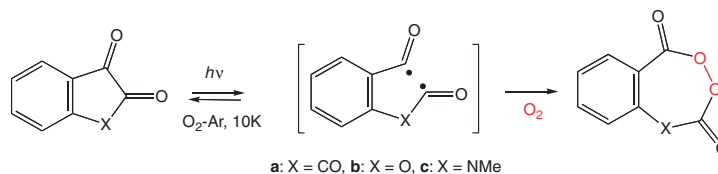


Photolysis of Indan-1,2-dione Derivatives in Oxygen-Doped Argon Matrix at Low Temperature

T. Itoh, J. Tatsugi,* and H. Tomioka*

Bull. Chem. Soc. Jpn. **2009**, *82*, 475–481

Photolysis of indan-1,2,3-trione (**1a**), benzo[*b*]furan-2,3-dione (**1b**), and *N*-methylisatin (**1c**) in argon doped with 20% oxygen at 10 K gave cyclic diacyl peroxide formed by trapping of initial diradical by molecular oxygen, which provides useful information concerning the reactivities of cyclic ketones toward type I cleavage.

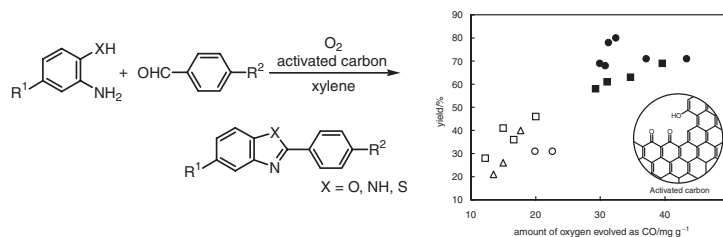


Mechanistic Study of Oxidative Aromatization Using Activated Carbon–Molecular Oxygen System in the Synthesis of 2-Arylbenzoxoles: Focus on the Role of Activated Carbon

Y. Kawashita, J. Yanagi, T. Fujii, and M. Hayashi*

Bull. Chem. Soc. Jpn. **2009**, *82*, 482–488

Tailor-made activated carbons were characterized to clarify their properties. After examining their effects on reactivity in the oxidative aromatization, we found that the essential role of activated carbon is concerned with surface oxygen groups such as carbonyl groups on the surface of activated carbon.



Photochromic Inclusion Crystals of Phosphonium Halides with Aromatic Alcohols

K. Tanaka,* H. Itoh, A. Nakashima, D. Wójcik, and Z. Urbanczyk-Lipkowska*

Bull. Chem. Soc. Jpn. **2009**, *82*, 489–493

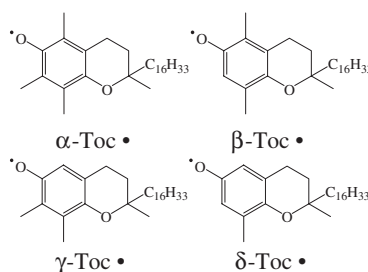
Some inclusion crystals of phosphonium salts with aromatic alcohols were shown to exhibit thermally reversible photochromism in the solid state.



Formation and Decay Dynamics of Vitamin E Radical in the Antioxidant Reaction of Vitamin E

K. Mukai,* A. Ouchi,* A. Mitarai, K. Ohara, and C. Matsuoka

Bull. Chem. Soc. Jpn. **2009**, *82*, 494–503

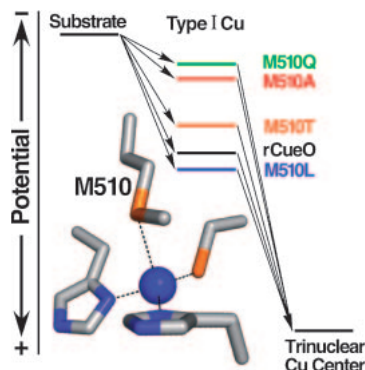


In order to understand the dynamics of antioxidant actions of vitamin E (α -, β -, γ -, and δ -tocopherols) in biological systems, kinetic study of the formation and decay reactions of vitamin E radicals (α -, β -, γ -, and δ -tocopheroxyls) has been performed in organic solvents, using stopped-flow spectrophotometry.

Modification of Spectroscopic Properties and Catalytic Activity of *Escherichia coli* CueO by Mutations of Methionine 510, the Axial Ligand to the Type I Cu

S. Kurose, K. Kataoka,* N. Shinohara, Y. Miura, M. Tsutsumi, S. Tsujimura, K. Kano, and T. Sakurai

Bull. Chem. Soc. Jpn. **2009**, *82*, 504–508

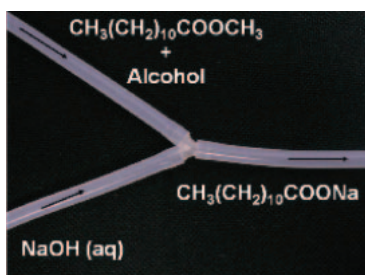


Replacement of Met510, the axial ligand to the type I Cu in a cuprous oxidase CueO, with Leu afforded the three-coordinated type I Cu, while Gln, Ala, and Thr mutations led to the type I Cu with the oxygen ligands.

Accelerated Saponification of Methyl Dodecanoate with Aqueous Sodium Hydroxide Solution in the Presence of Alcohols in a Silicone Rubber Tube as a Flow-Type Reactor

A. Kamiouji, K. Hashimoto, H. Kominami,* and S. Ito

Bull. Chem. Soc. Jpn. **2009**, *82*, 509–513

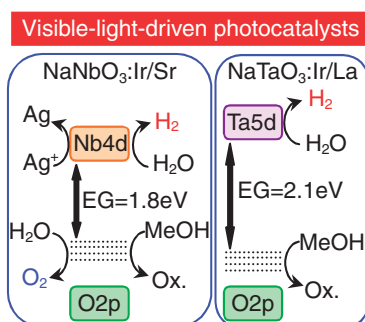


Saponification, a typical two-phase reaction, in a silicone tube was drastically accelerated in the presence of a small amount of alcohols and the reaction rates of saponification in the tube were much larger than those in a traditional batch system.

Sensitization of NaMO₃ (M: Nb and Ta) Photocatalysts with Wide Band Gaps to Visible Light by Ir Doping

A. Iwase, K. Saito, and A. Kudo*

Bull. Chem. Soc. Jpn. **2009**, *82*, 514–518

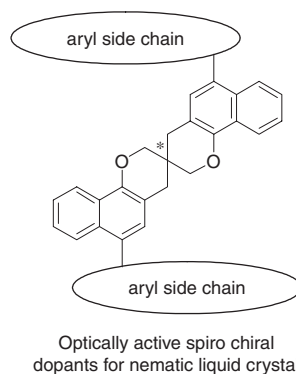


NaMO₃:Ir/A (M: Nb and Ta, A: Sr, Ba, and La) photocatalysts showed H₂ or O₂ evolution under visible light irradiation. These photocatalytic reactions proceeded accompanied by electronic transition from the electron donor levels formed with Ir³⁺ to the conduction bands.

Synthesis of Optically Active Spiro Compounds with a 3,3'-(4*H*,4'*H*)-Spirobi(2*H*-naphtho[1,2-*b*]pyran) Skeleton and Their Applications as Chiral Dopants for Nematic Liquid Crystals

K. Tojo,* T. Arisawa, Y. Aoki, and D. Terunuma

Bull. Chem. Soc. Jpn. **2009**, *82*, 519–527



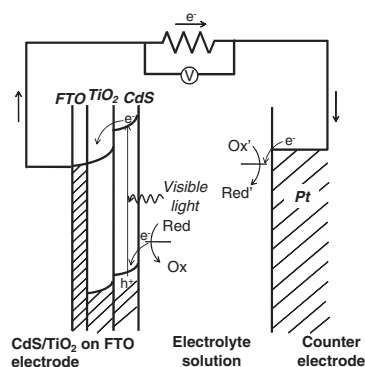
Chiral dopants with an optically active 3,3'-(4*H*,4'*H*)-spirobi(2*H*-naphtho[1,2-*b*]pyran) skeleton for nematic liquid crystals were synthesized, and their helical twisting power (HTP) values were evaluated. It was found that optically active spiro chiral dopants have the potential for inducing large HTP values.

Selected Paper

CdS Nanoparticles Exhibiting Quantum Size Effect by Dispersion on TiO₂: Photocatalytic H₂ Evolution and Photoelectrochemical Measurements

K. Ogisu, K. Takanabe, D. Lu, M. Saruyama, T. Ikeda, M. Kanehara, T. Teranishi, and K. Domen*

Bull. Chem. Soc. Jpn. **2009**, *82*, 528–535



CdS quantum dots (Q-CdS) with a narrow particle size distribution were immobilized on an oxide substrate in attempt to preserve particle size and optical property during photoelectrochemical reaction in Na₂S–Na₂SO₃ solution under visible light.

Pressure Dependence of Aggregation State of (DMPC/Cholesterol) Mixed Monolayer Based on AFM Observation

Y. Tagami, T. Matsufuji, H. Ikigai, T. Narita, and Y. Oishi*

Bull. Chem. Soc. Jpn. **2009**, *82*, 536–538

AFM images of a DMPC/cholesterol mixed monolayer revealed a macroscopically morphological homogenization of the monolayer by compression and an appearance of a nanoscopically separated structure on the macroscopically homogeneous surface.

