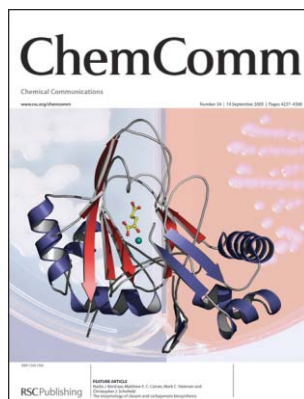




Cover
See Takashi Jin, Fumihiko Fujii, Hiroshi Sakata, Mamoru Tamura and Masataka Kinjo, page 4300. New functional quantum dots can be used for the detection of the neurotransmitter acetylcholine. Image reproduced by permission of Takashi Jin *et al.*, from *Chem. Commun.*, 2005, 4300.



Inside cover
See Nadia J. Kershaw, Matthew E. C. Caines, Mark C. Sleeman and Christopher J. Schofield, page 4251. The enzymology of clavam and carbapenem biosynthesis. Image reproduced by permission of Christopher J. Schofield *et al.*, from *Chem. Commun.*, 2005, 4251.

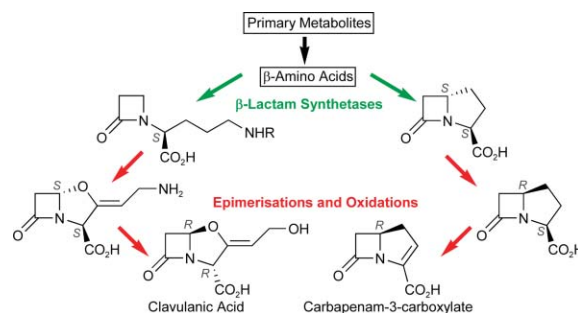
FEATURE ARTICLE

4251

The enzymology of clavam and carbapenem biosynthesis

Nadia J. Kershaw, Matthew E. C. Caines, Mark C. Sleeman and Christopher J. Schofield*

The enzymology of clavam and carbapenem biosynthesis is reviewed. The common role of unusual oxidation and epimerisation reactions is highlighted.



COMMUNICATIONS

4264

Ligand amplification in a dynamic combinatorial glycopeptide library

Tom Hotchkiss, Holger B. Kramer, Katie J. Doores, David P. Gamblin, Neil J. Oldham and Benjamin G. Davis*

N-acetyl glucosamine binding protein amplifies the concentration of one member in a dynamic combinatorial glycopeptide library based on exchanging disulfides.



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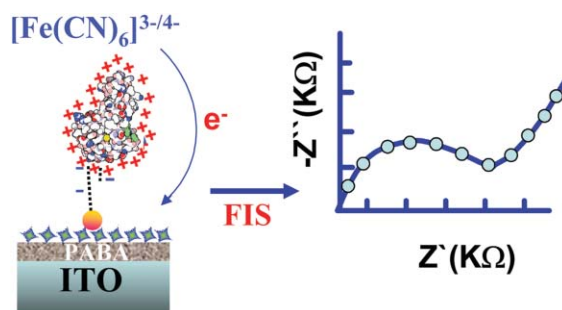
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4267

Aptamer biosensor for label-free impedance spectroscopy detection of proteins based on recognition-induced switching of the surface charge

Marcela C. Rodriguez, Abdel-Nasser Kawde and Joseph Wang*

The aptamer-protein binding event reverses the electrode charge from negative to positive, leading to attraction of the previously repelled negatively-charged marker towards the electrode surface decreasing the interfacial electron transfer.

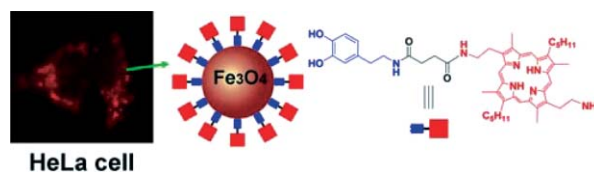


4270

Synthesis and cellular uptake of porphyrin decorated iron oxide nanoparticles—a potential candidate for bimodal anticancer therapy

Hongwei Gu, Keming Xu, Zhimou Yang, Chi K. Chang and Bing Xu*

Using a dopamine-based anchor to covalently attach porphyrin derivatives to iron oxide nanoparticles may lead to a simple and general pathway to produce a bimodal anticancer agent for both photodynamic therapy and hyperthermia treatment.



4273

Gold nanoparticle-based competitive colorimetric assay for detection of protein–protein interactions

Chang-Sheng Tsai, Ting-Bin Yu and Chao-Tsen Chen*

A gold nanoparticle-based competitive colorimetric assay uses the ensemble of Concanavalin (ConA) and mannopyranoside-encapsulated gold nanoparticles (Man-GNPs) to identify the binding partners for ConA and the binding constants are determined based on the wavelength shifts.

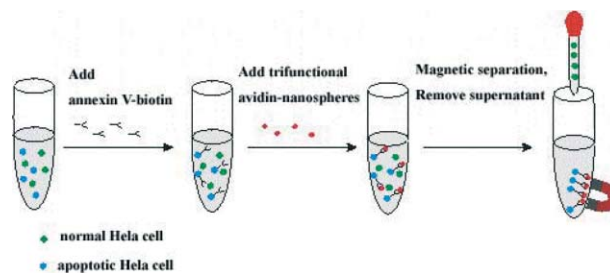


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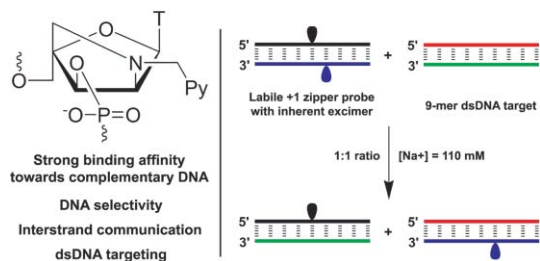
Biofunctionalization of fluorescent-magnetic-bifunctional nanospheres and their applications

Guo-Ping Wang, Er-Qun Song, Hai-Yan Xie, Zhi-Ling Zhang, Zhi-Quan Tian, Chao Zuo, Dai-Wen Pang,* Dao-Cheng Wu and Yun-Bo Shi

Novel fluorescent-magnetic-biotargeting trifunctional nanospheres with surface-confined IgG, avidin, and biotin were constructed, which can be used in a number of biomedical applications, including visual sorting and manipulation of apoptotic cells as demonstrated here.



4279

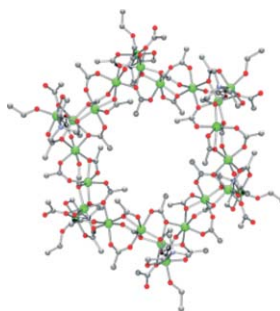


Targeting of mixed sequence double-stranded DNA using pyrene-functionalized 2'-amino- α -L-LNA

Patrick J. Hrdlicka, T. Santhosh Kumar and Jesper Wengel*

Labile double-stranded +1 zipper probes of pyrene-functionalized 2'-amino- α -L-LNAs are used to target double-stranded DNA. The recognition process is monitored using the inherent interstrand pyrene-pyrene excimer of the probe.

4282

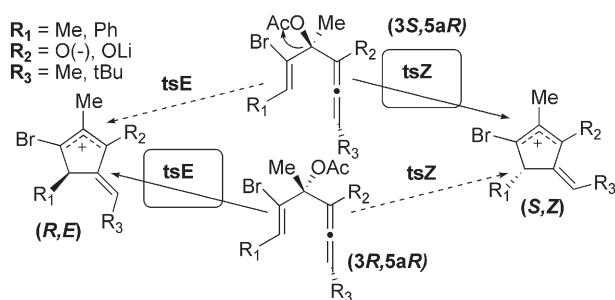


High-nuclearity homometallic iron and nickel clusters: Fe₂₂ and Ni₂₄ complexes from the use of *N*-methyldiethanolamine

Dolos Foguet-Albiol, Khalil A. Abboud and George Christou*

The use of *N*-methyldiethanolamine (mdaH₂) in reactions with Fe(III) and Ni(II) sources has led to very large Fe₂₂ and Ni₂₄ products, possessing $S = 0$ and $S = 6$ ground states, respectively.

4285

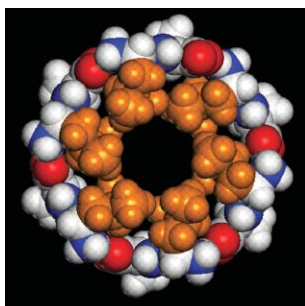


Mechanistic subtleties in the cyclopentannulation of allenolate allyl carbamates: the origin of the center-to-center chirality transfer

Olalla Nieto Faza, Carlos Silva López, Rosana Álvarez and Ángel R. de Lera*

A theoretical study of the stereospecificity in the cyclization of allenolate allyl carbamates shows that this process, displaying features of pericyclic and ionic mechanisms, is concerted and benefits from $\pi_{\text{allenolate}}-\sigma_{\text{leaving group}}^*$ charge donation.

4288



Microporous organic crystals: an unusual case for L-leucyl-L-serine

Carl Henrik Görbitz,* Mette Nilsen, Kai Szeto and Linda Wibecke Tangen

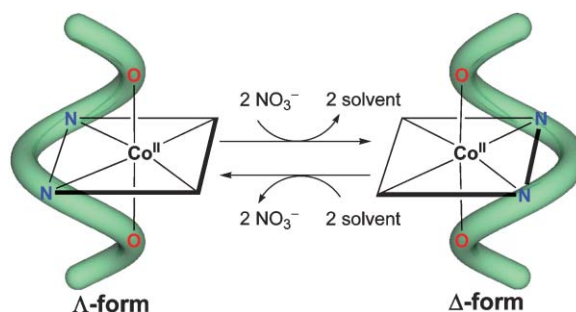
Cocrystallized acetonitrile solvent molecules located inside 5.2 Å channels in the crystal structure of L-leucyl-L-serine have been replaced by I₂ molecules with full retention of the peptide scaffold.

4291

Dynamic helicity inversion in an octahedral cobalt(II) complex system via solvato-diastereomerism

Hiroyuki Miyake,* Hideki Sugimoto, Hitoshi Tamiaki and Hiroshi Tsukube

The helical sense of a mononuclear Co(II) complex with an amino acid-based chiral tetradentate ligand was dynamically inverted by changing the solvent component.

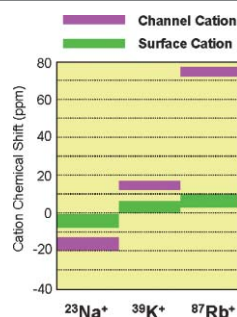


4294

Solid-state ^{87}Rb NMR signatures for rubidium cations bound to a G-quadruplex

Ramsey Ida and Gang Wu*

First solid-state ^{87}Rb NMR characterization for Rb^+ cations bound to a G-quadruplex structure.

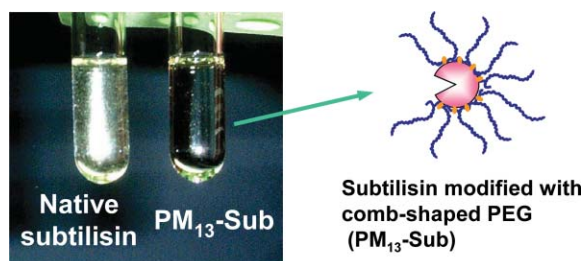


4297

Comb-shaped poly(ethylene glycol)-modified subtilisin Carlsberg is soluble and highly active in ionic liquids

Kazunori Nakashima, Tatsuo Maruyama, Noriho Kamiya and Masahiro Goto*

Subtilisin Carlsberg conjugated with comb-shaped poly(ethylene glycol) exhibits higher transesterification activity in $[\text{Emim}][\text{Tf}_2\text{N}]$ than in organic solvents commonly used for enzymatic biotransformation.

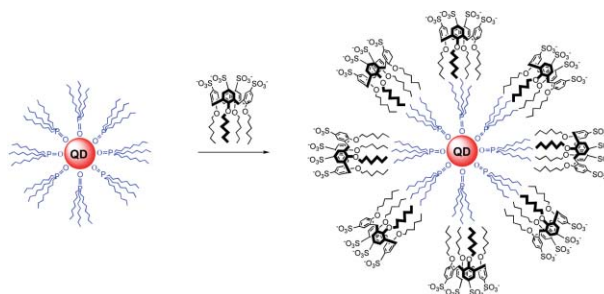


4300

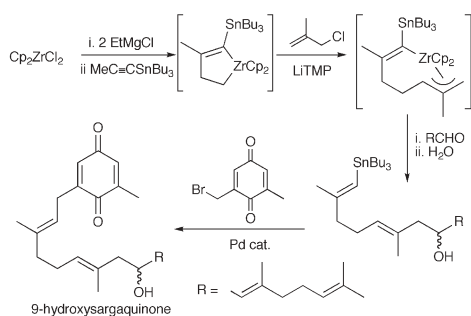
Amphiphilic p-sulfonatocalix[4]arene-coated CdSe/ZnS quantum dots for the optical detection of the neurotransmitter acetylcholine

Takashi Jin,* Fumihiko Fujii, Hiroshi Sakata, Mamoru Tamura and Masataka Kinjo

Water-soluble CdSe/ZnS (core-shell) semiconductor quantum dots surface-modified with amphiphilic p-sulfonatocalix[4]arene derivatives were synthesized for the optical detection of the neurotransmitter acetylcholine.



4303

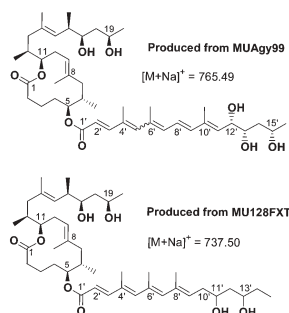


Zirconium mediated total synthesis of crinitol, 9-hydroxyfarnesoic acid, 9-hydroxyfarnesol, 9-hydroxysargaquinone and the selectively-protected aglycone of moritoside and euplexide A

Sally Dixon, George J. Gordon and Richard J. Whitby*

Tandem addition of zirconocene(ethene) to 1-tributylstannylpropyne, insertion of methallyl carbenoid and aldehyde addition efficiently assembles precursors to a variety of terpenoid natural products.

4306

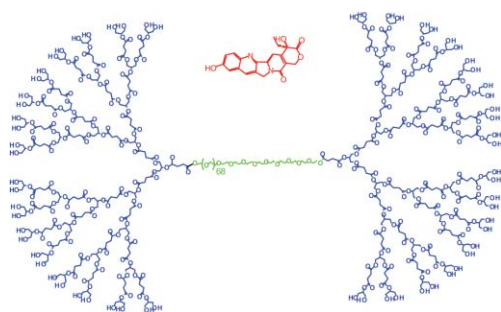


Structure elucidation of a novel family of mycolactone toxins from the frog pathogen *Mycobacterium* sp. MU128FXT by mass spectrometry

Hui Hong, Tim Stinear, Paul Skelton, Jonathan B. Spencer and Peter F. Leadley*

Structures are proposed for a novel family of mycolactone toxins isolated from the frog pathogen MU128FXT and differing from those produced by the human pathogen *M. ulcerans* MUAg99 in having an altered polyketide side chain.

4309

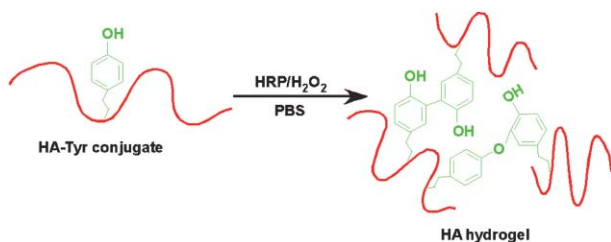


Dendritic supramolecular assemblies for drug delivery

Meredith T. Morgan, Michael A. Carnahan, Stella Finkelstein, Carla A. H. Prata, Lovorka Degoricija, Stephen J. Lee and Mark W. Grinstaff*

Functional supramolecular assemblies were formed in water with the anticancer drug 10-hydroxycamptothecin and the dendritic macromolecule, $([\text{G}4]\text{-PGLSA-OH})_2\text{-PEG}_{3400}$.

4312



Injectable biodegradable hydrogels composed of hyaluronic acid-tyramine conjugates for drug delivery and tissue engineering

Motoichi Kurisawa,* Joo Eun Chung, Yi Yan Yang, Shu Jun Gao and Hiroshi Uyama

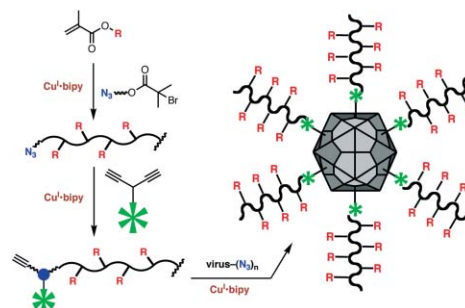
We propose a novel *in situ* gel-forming system composed of hyaluronic acid-tyramine (HA-Tyr) conjugates using a horseradish peroxidase (HRP)-catalysed oxidation reaction. Hydrogels were formed *in vivo* by injecting two solutions through syringes: (i) HA-Tyr solution containing H_2O_2 and (ii) HRP as a catalyst which induces the oxidative coupling of the phenol moiety.

4315

Virus–glycopolymer conjugates by copper(I) catalysis of atom transfer radical polymerization and azide–alkyne cycloaddition

Sayam Sen Gupta, Krishnaswami S. Raja, Eiton Kaltgrad, Erica Strable and M. G. Finn*

The construction of polymer-covered surfaces is made convenient by Cu^{I} catalysis of polymerization, end-labeling, and attachment steps. The example described here is fluorophore-labeled glycopolymer chains on a virus particle scaffold.

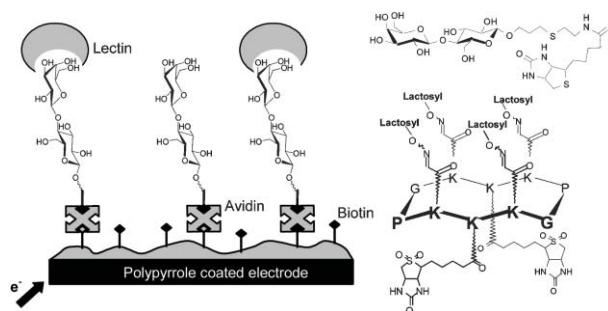


4318

Electrochemical detection of *Arachis hypogaea* (peanut) agglutinin binding to monovalent and clustered lactosyl motifs immobilized on a polypyrrole film

Marie-Pierre Dubois, Chantal Gondran, Olivier Renaudet, Pascal Dumy, Hugues Driguez, Sébastien Fort* and Serge Cosnier*

Direct detection of peanut agglutinin/lactose interactions was realized by an electrochemical approach based on a polypyrrole coated electrode displaying pendant carbohydrates.

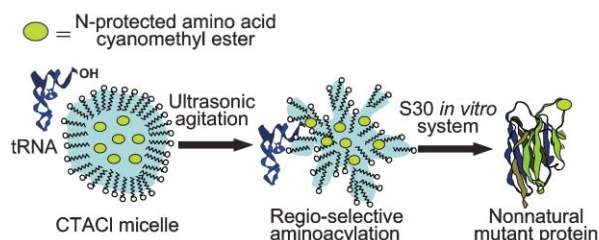


4321

Simple and quick chemical aminoacylation of tRNA in cationic micellar solution under ultrasonic agitation

Naoto Hashimoto, Keiko Ninomiya, Takamasa Endo and Masahiko Sisido*

Aminoacylation of a tRNA with a non-natural amino acid was achieved by using an *N*-protected amino acid cyanomethyl ester as a substrate solubilized in CTACl micelle under ultrasonic agitation.

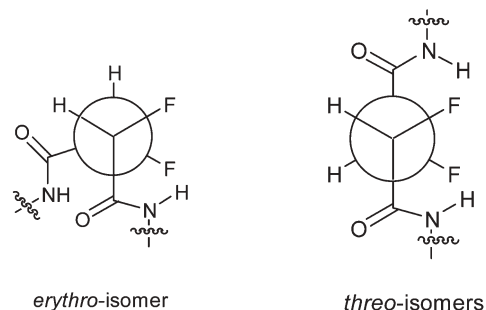


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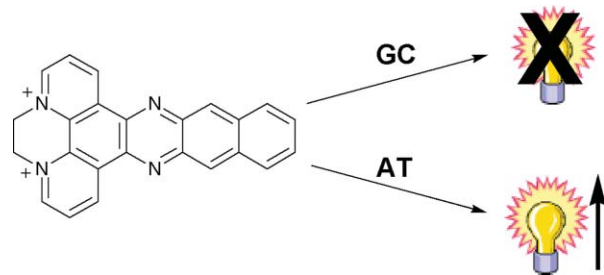
The vicinal F–C–C–F moiety as a tool for influencing peptide conformation

Martin Schüler, David O'Hagan* and Alexandra M. Z. Slawin

The *erythro*- and *threo*-isomers of bis(amino acid) 2,3-difluorosuccinamides display very different conformations. In particular, the *gauche*-preference for the vicinal C–F bonds influences the relative positioning (*gauche* vs. *anti*) of the amide groups, a property which could find utility in influencing the conformation of peptide mimetics.



4327

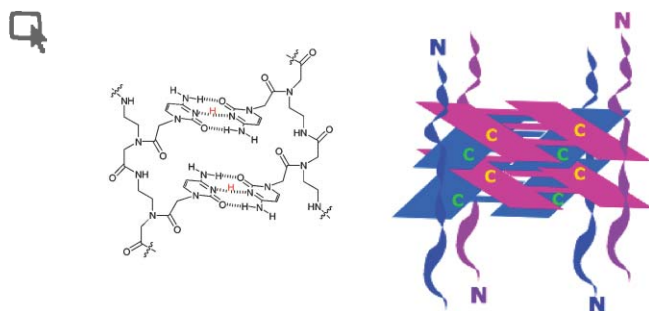


Water-soluble organic dppz analogues—tuning DNA binding affinities, luminescence, and photo-redox properties

Tim Phillips, Chatna Rajput, Lance Twyman, Ihtshamul Haq and Jim A. Thomas*

A water-soluble organic anion related to the dppz fragment binds to duplex DNA with an affinity comparable to $[\text{Ru}^{\text{II}}(\text{dppz})]$ complexes showing a two orders of magnitude preference for GC over AT sequences. Binding to GC sequences is accompanied by luminescent quenching, while binding to AT sequences results in luminescent enhancement.

4330

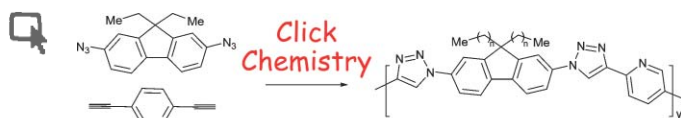


PNA C-C⁺ *i*-motif: superior stability of PNA TC₈ tetraplexes compared to DNA TC₈ tetraplexes at low pH

Nagendra K. Sharma and Krishna N. Ganesh*

Self-assembly of PNA TC₈ leads to formation of a hitherto unknown C-C⁺ tetraplex (*i*-motif) in acidic pH, with higher stability than the analogous dTC₈.

4333

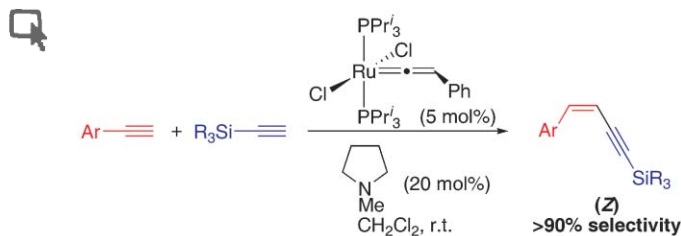


Click-chemistry as an efficient synthetic tool for the preparation of novel conjugated polymers

Dirk Jan V. C. van Steenis, Olivier R. P. David, Gino P. F. van Strijdonck, Jan H. van Maarseveen* and Joost N. H. Reek*

We have developed a general efficient route towards conjugated polymers utilizing click chemistry and in the current example fluorene based polymers have been prepared. The pyridyl-triazole units within the polymer can be used for further post-functionalization.

4336



(*Z*)-Selective cross-dimerization of arylacetylenes with silylacetylenes catalyzed by vinylideneruthenium complexes

Hiroyuki Katayama,* Hiroshi Yari, Masaki Tanaka and Fumiyuki Ozawa*

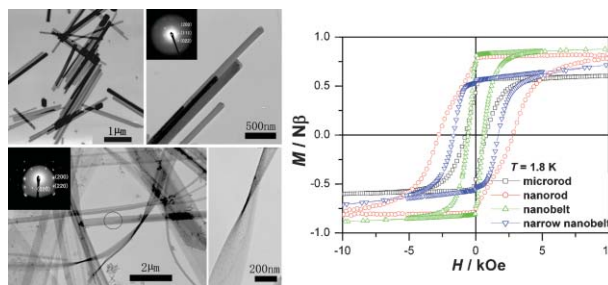
The vinylideneruthenium(II) complex bearing bulky and basic triisopropylphosphine ligands, $\text{RuCl}_2(=\text{C}=\text{CHPh})(\text{PPr}_3)_2$, serves as a good catalyst precursor for (*Z*)-selective cross-dimerization between arylacetylenes and silylacetylenes in the presence of *N*-methylpyrrolidine.

4339

Shape-dependent magnetic properties of low-dimensional nanoscale Prussian blue (PB) analogue $\text{SmFe}(\text{CN})_6 \cdot 4\text{H}_2\text{O}$

Hao-Ling Sun, Hongtao Shi, Fei Zhao, Limin Qi* and Song Gao*

Unique nanorods and nanobelts of Prussian blue (PB) analogue $\text{SmFe}(\text{CN})_6 \cdot 4\text{H}_2\text{O}$ have been successfully synthesized by using reverse micelles as colloidal soft templates; magnetic studies show that the shape of the material is a dominating factor for its coercivity.

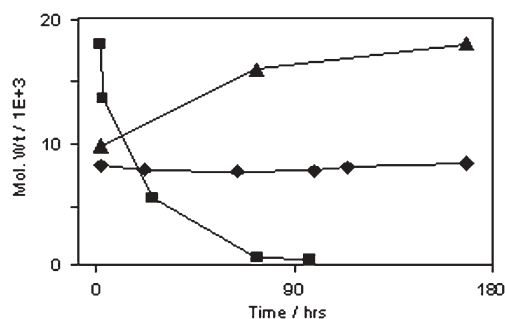


4342

Self-repairing polymers: poly(dioxaborolane)s containing trigonal planar boron

Weijun Niu, Caroline O'Sullivan, Brett M. Rambo, Mark D. Smith and John J. Lavigne*

Poly(dioxaborolane)s containing trigonal planar boron are stable, self-repairing polymers which can be shortened or lengthened post-polymerization. Degraded material is repaired without the need for added catalyst or reintroduction to synthetic conditions.

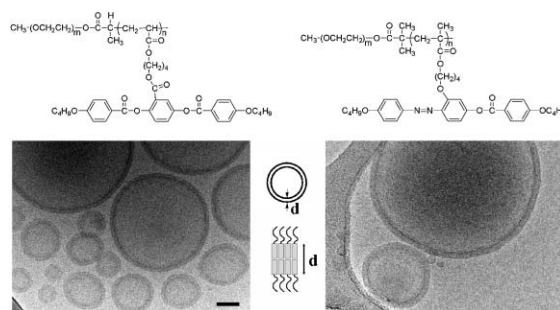


4345

Polymer vesicles formed by amphiphilic diblock copolymers containing a thermotropic liquid crystalline polymer block

Jing Yang, Daniel Lévy, Wei Deng, Patrick Keller and Min-Hui Li*

Novel amphiphilic diblock copolymers composed of PEG and a thermotropic liquid crystalline polymer have been synthesized using atom transfer radical polymerization. Cryo-electron microscopy studies revealed that these amphiphiles self-assemble in water to form unilamellar vesicles.

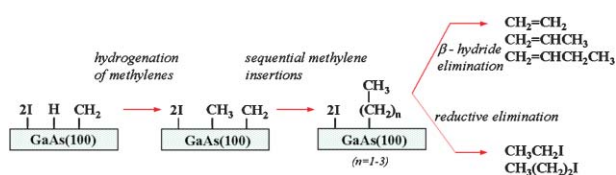


4348

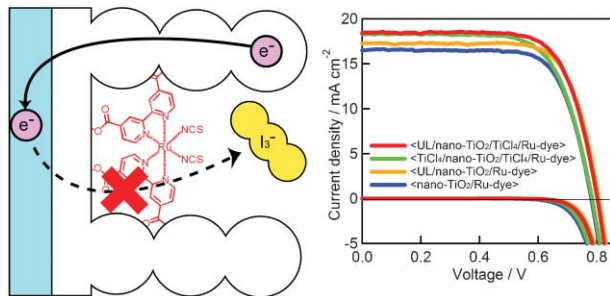
Evidence of carbon-carbon bond formation on GaAs(100) via Fischer-Tropsch methylene insertion reaction mechanism

Neil T. Kemp and Nagindar K. Singh*

Sequential multiple methylene (CH_2) insertions into adsorbed methyl species on clean gallium-rich GaAs(100)-(4 × 1) occur to form higher alkenes (ethene, propene, butene) and two higher alkyl iodides (iodoethane, iodopropane), not reported for a semiconductor surface previously.



4351

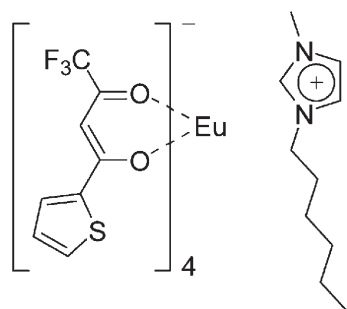


Control of dark current in photoelectrochemical ($\text{TiO}_2/\text{I}^-/\text{I}_3^-$) and dye-sensitized solar cells

Seigo Ito,* Paul Liska, Pascal Comte, Raphaël Charvet, Peter Péchy, Udo Bach, Lukas Schmidt-Mende, Shaik Mohammed Zakeeruddin, Andreas Kay, Mohammad K. Nazeeruddin and Michael Grätzel

The charge-recombination blocking effects of Ru dye, a TiCl_4 treatment and compact TiO_2 underlayer have been clarified in dye-sensitized solar cells. Controlling the dark current achieved impressive efficiency (10.8%).

4354

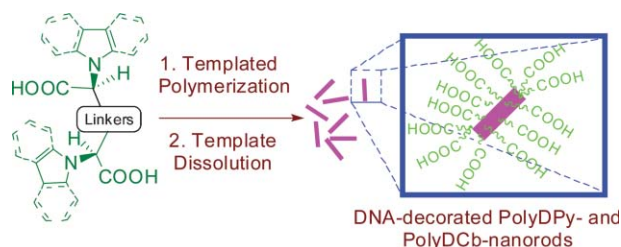


Photostability of a highly luminescent europium β-diketonate complex in imidazolium ionic liquids

Peter Nockemann, Eva Beurer, Kris Driesen, Rik Van Deun, Kristof Van Hecke, Luc Van Meervelt and Koen Binnemans*

Solutions of a luminescent europium(III) tetrakis(β-diketonate) complex in imidazolium ionic liquids have a higher photostability than solutions of the same complex in classic organic solvents.

4357

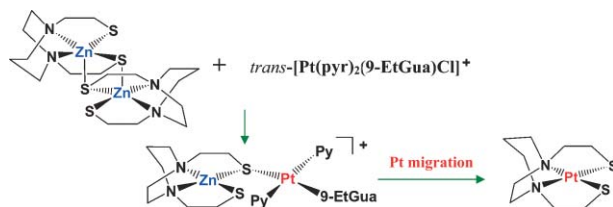


Polydipyrrole- and polydicarbazole-nanorods as new nanosized supports for DNA hybridization

Jean-Paul Lellouche,* Senthil Govindaraji, Augustine Joseph, Jyongsik Jang* and Kyung Jin Lee

AAO template-synthesized novel functional COOH polydipyrrole- and polydicarbazole nanorods were tested for covalent DNA attachment and hybridization.

4360



Thiolate-bridged heterodinuclear platinum–zinc chelates as models for ternary platinum–DNA–protein complexes and zinc ejection from zinc fingers. Evidence from studies using ESI-mass spectrometry

Qin Liu, Melissa Golden, Marcetta Y. Darensbourg and Nicholas Farrell*

Structures for models of ternary platinum–DNA–protein complexes and zinc ejection from zinc fingers by platinum were deduced from the ESI-MS spectra of the interaction of model Zn and Pt complexes.


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