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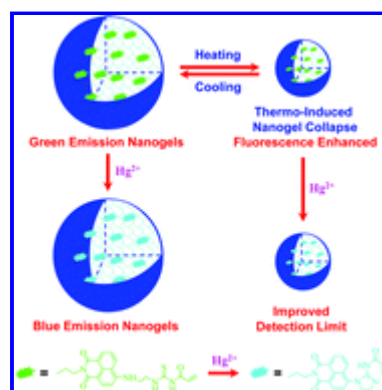
Archive for the 'Hot Article' Category

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[Hot Article: Mercury and temperature sensing nanogel](#)

19 Oct 2010

Nanogel-based sensors with dual temperature and mercury ion detection capabilities is reported in this 'Hot Article' from Changhua Li and Shiyong Liu from the University of Science and Technology of China in Hefei. This is the first report of successful integration of stimuli-responsive nanogels with well-developed small molecule reaction-based selective metal ion sensing moieties.



Mercury is one of the most harmful heavy metal ions to humans, therefore sensitive detection and imaging in organisms and tissue is crucial. To achieve this, current efforts have focused on the invention of ratiometric, water-soluble, and cell-permeable Hg^{2+} -sensing ensembles.

In this study, Li and Liu synthesise a 1,8-naphthalimide-based polarity-sensitive and Hg^{2+} -reactive monomer (NPTUA) and copolymerise this with *N*-isopropylacrylamide (NIPAM) to produce NUPTA labelled PNIPAM nanogels. The nanogel-based chemosensors possess a high selectivity and sensitivity for Hg^{2+} at room temperature, achieving a detection limit at the nanomolar level on a ratiometric basis. Furthermore, thermo-induced nanogel collapse can considerably enhance the detection sensitivity.

Interested in knowing more? Read the full article [here...](#) FREE until November 16th.

[Responsive nanogel-based dual fluorescent sensors for temperature and \$\text{Hg}^{2+}\$ ions with enhanced detection sensitivity](#)

Changhua Li and Shiyong Liu

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM01828G, Paper



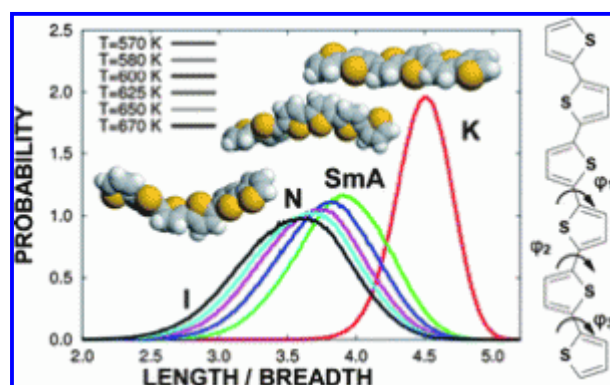


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[Hot Article: liquid crystalline sexithiophene simulation](#)

18 Oct 2010

L. Muccioli and colleagues from the University of Bologna have investigated, using atomistic molecular dynamics simulations, the high temperature molecular organization of the linear oligothiophene α -sexithienyl (T6), well known for its organic electronics applications. The team found that the torsional flexibility of sexithiophene allows for a temperature dependence of the aspect ratio, which drives the formation of nematic and smectic liquid crystalline phases.



Liquid crystalline oligothiophenes are of interest as they may provide the best morphology to maximise overlap between neighbouring molecules, thus conferring the greatest charge (hole) mobility between molecular units. Due to the difficulty of performing experimental measurements at $\sim 600\text{K}$ this theoretical study was performed to investigate the potential of liquid crystal oligothiophenes. The authors hope that their findings will stimulate future experimental determinations.

Interested in knowing more? Read the full article [here](#). FREE until November 15th.

[An atomistic simulation of the liquid-crystalline phases of sexithiophene](#)

A. Pizzirusso, M. Savini, L. Muccioli and C. Zannoni

J. Mater. Chem., 2011, Advance Article

DOI: 10.1039/C0JM01284J, Paper

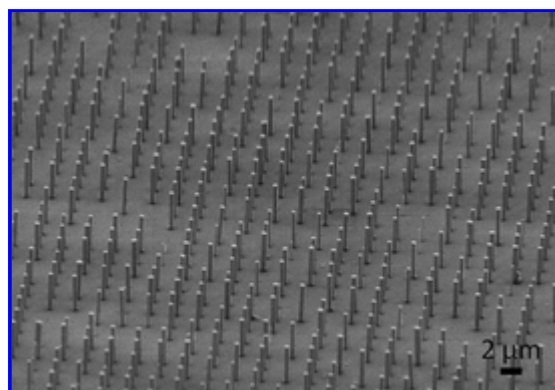


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[Nanowire and nanotube arrays feature in two new 'Hot Articles'](#)

15 Oct 2010

Two new *Journal of Materials Chemistry* 'Hot Articles' have been published online which feature arrays, one of nanowires, and one of nanotubes. These arrays have exciting potential in a wide range of applications.



[Growth and replication of ordered ZnO nanowire arrays on general flexible substrates](#)

Su Zhang, Yue Shen, Hao Fang, Sheng Xu, Jinhui Song and Zhong Lin Wang

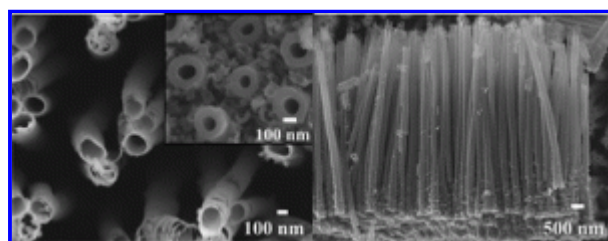
J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM02915G, Communication

A team from Peking University and the Georgia Institute of Technology describe the synthesis, via hydrothermal method on flexible substrates of vertically aligned and site controllable ZnO nanowire arrays in this *Journal of Materials Chemistry* Communication.

During the past several years, there has been a growing interest in one-dimensional ZnO nanostructures for their potential applications in fabricating electronic, optoelectronic, electromechanical and electrochemical devices. Current synthesis techniques require single crystallinity of the substrate and high growth temperatures, seriously limiting the compatibility of these methods with organic substrates for applications in flexible electronics. Hydrothermal synthesis is an attractive alternative because it could be carried out at a relatively low temperature around 70–90 °C, and could allow for multiple crystalline and even amorphous substrates. Zhong Lin Wang and colleagues have developed a new technique of synthesizing patterned ZnO nanowire arrays on multiple flexible organic substrates using a novel chemical approach and a new transferring method.

To find out more read the [full article here](#). Free until November 12th!



[Self-assembled anodic TiO₂ nanotube arrays: electrolyte properties and their effect on resulting morphologies](#)

Sorachon Yoriya and Craig A. Grimes

J. Mater. Chem., 2011, Advance Article

DOI: 10.1039/C0JM02421J, Paper

A team from The Pennsylvania State University have, for the first time, revealed the parameters, during synthesis, which affect the morphology of TiO₂ nanotube arrays.

Self-assembled TiO₂ nanotube arrays fabricated by electrochemical anodization of titanium are of great interest having been successfully used in many applications including gas sensing, water photoelectrolysis, drug delivery and photovoltaics. In the synthesis of TiO₂ nanotube array films it is important to achieve specific nanotube array morphological features, including pore size, length, wall thickness, and tube-to-tube spacing for enhanced device performance, however, the key parameters controlling self-organization of the nanotubes have remained unclear. This study, by Sorachon Yoriya and Craig Grimes elucidates the dependence of the electrolyte conductivity on the titanium concentration, and electrolyte effect on the morphological features of the resulting nanotubes.

To find out more read the [full article here](#). Free until November 12th!

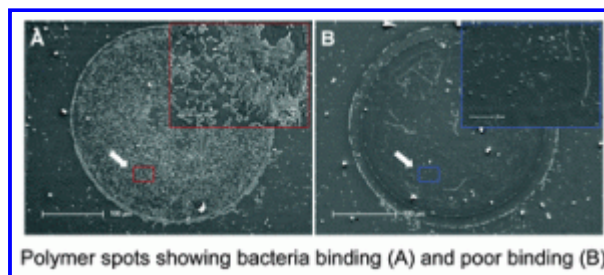


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[Hot Article: Banishing bad bacteria](#)

14 Oct 2010

Polymers that can capture harmful bacteria as they pass through the gut have been developed by UK scientists. This could reduce incidence of salmonella poisoning and improve shelf-life of meat products, they claim.



Salmonella, a major food-borne pathogen is a serious problem in the food industry, as well as of clinical and veterinary importance. The 'use-by date' marked on foods reflects the date by which such bacteria will have multiplied to their maximum safe level for consumption.

'If the pathogen level can be lowered at the point of food production, then the shelf-life may become longer and the food safer,' says Mark Bradley at Edinburgh University. In collaboration with Maurice Gallagher, also at Edinburgh University, Bradley's team have identified polymers that bind strongly to a particular strain of salmonella while having minimal effect on the beneficial 'good' bacteria. These polymers could be added to commercial feedstuff for animals, such as chickens.

This article has featured in *Highlights in Chemical Science* and has been selected as a 'Hot Article' for *Journal of Materials Chemistry*. It will be [free to read](#) until the 9th November.

To view Erica Wise's full [Highlights in Chemical Science](#) article, please click here: [Banishing bad bacteria](#)

To read the full article please click here: [Colonising new frontiers—microarrays reveal biofilm modulating polymers](#)

Salvatore Pernagallo, Mei Wu, Maurice P. Gallagher and Mark Bradley

J. Mater. Chem., 2011, Advance Article

DOI: 10.1039/C0JM01987A, Paper

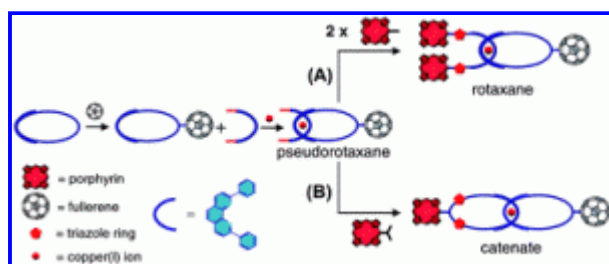


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[Hot Article: Buckyballs drive electron transfer for solar energy](#)

11 Oct 2010

David Schuster, Jackson Megiatto and Robert Spencer have developed a powerful and versatile new methodology for the preparation of nanoscale photoactive interlocked structures with appended [60]fullerene groups. The group from New York University used a straightforward one-pot procedure based on Cu(I)-template synthesis and “click” chemistry.



The use of organic materials for absorption of solar energy and conversion into high energy charge-separated carriers has been reproduced in the laboratory by carefully designed artificial arrays containing electron donor and acceptor (D–A) subunits. The synthetic achievements described in this paper open the door to the preparation of nanoscale D–A materials with rotaxane and catenane topologies not accessible previously. Introduction of C₆₀ groups in interlocked structures generates the driving force allowing electron transfer reactions to occur over very long distances.

Interested in knowing more? This article will be free until the 8th November, read it [here](#).

[Optimizing reaction conditions for synthesis of electron donor-\[60\]fullerene interlocked multiring systems](#)

Jackson D. Megiatto Junior, Robert Spencer and David I. Schuster

J. Mater. Chem., 2011, Advance Article

DOI: 10.1039/C0JM02154G, Paper

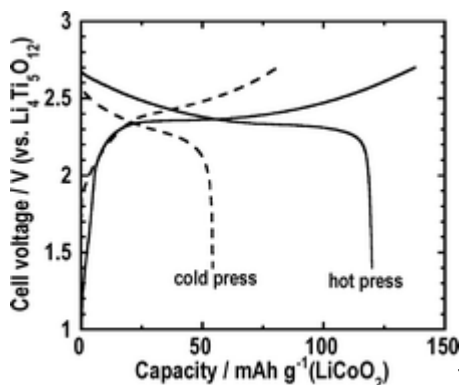




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[Hot Article: Improving the electrode-electrolyte interfaces in all-solid-state rechargeable lithium batteries using liquid state electrolytes](#)

07 Oct 2010



In order to reduce emissions of CO_2 , high-performance lithium ion batteries have received a lot of attention as new large-scale power storage systems for eco-cars. In order to improve the electrochemical performance of the all-solid-state cells, an electrochemically favourable electrode–electrolyte interface has to be fabricated. In the case of using solid electrolytes, it is considered that the contact area between active materials and solid electrolytes is smaller than the contact area between active materials and liquid electrolytes because solid electrolytes are not wettable and infiltrative like liquids.

To find a solution to this problem, Masahiro Tatsumisago and colleagues in Japan investigated the softening behavior of a $80\text{Li}_2\text{S}\cdot 20\text{P}_2\text{S}_5$ (mol%) glass electrolyte, and a favorable electrode–electrolyte interface was fabricated by sticking the supercooled liquid state of the $80\text{Li}_2\text{S}\cdot 20\text{P}_2\text{S}_5$ electrolyte on active material particles.

Interested in finding out more? Read the full article here:

[Fabrication of electrode–electrolyte interfaces in all-solid-state rechargeable lithium batteries by using a supercooled liquid state of the glassy electrolytes](#)

Hirokazu Kitaura, Akitoshi Hayashi, Takamasa Ohtomo, Shigenori Hama and Masahiro Tatsumisago

J. Mater. Chem., 2011, Advance Article

DOI: 10.1039/C0JM01090A , Paper

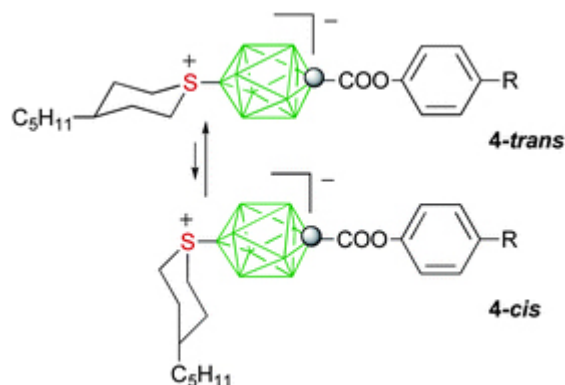


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[Hot Article: New class of high \$\Delta\epsilon\$ nematic liquid crystals](#)

06 Oct 2010

Polar liquid crystals are key components of mixtures for liquid crystals display (LCD) technologies and compounds that exhibit high dielectric anisotropy ($\Delta\epsilon$), moderate T_{NI} , and have minimal effect on material's viscosity are of particular interest for technological applications.



[Bryan Ringstrand and Piotr Kaszynski](#)

[J. Mater. Chem., 2010, Advance Article](#)

[DOI: 10.1039/C0JM02075C, Paper](#)

Bryan Ringstrand and Piotr Kaszynski have developed a new class of nematics with high $\Delta\epsilon$ for display applications and characterized them by thermal and dielectric methods in mixtures with 3 nematic hosts. These selenonium zwitterion esters represent a new concept in designing polar additives. They combine the polar zwitterionic fragment that gives rise to a large positive $\Delta\epsilon$, and shape-shifting ability, which results in high solubility, high effective electric dipole moment μ_{eff} , and relatively low contribution to rotational viscosity γ .

Interested in knowing more? Read the full article [here](#); it will be free to access until the 3rd November.

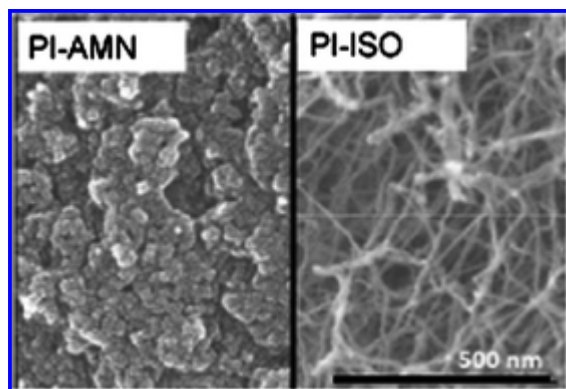


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[One-step room-temperature synthesis of fibrous polyimide aerogels from anhydrides and isocyanates and conversion to isomorphous carbons](#)

05 Oct 2010

Aerogels are low-density solids with high open porosity and surface area which have a potential niche in high temperature thermal insulation. The classic route of synthesis involves two expensive processes, supercritical drying and high temperature imidization.



In this study, Nicholas Leventis and co-workers in the USA have described polyimide aerogels synthesized via a low temperature process through the rather underutilized reaction of dianhydrides with diisocyanates. These polyimide aerogels are compared with those obtained by the classic high-temperature amine route and are shown to be chemically identical but morphologically different. Overall, the isocyanate route has several distinct advantages over the classic route.

Interested in knowing more? Read the full article [here](#).

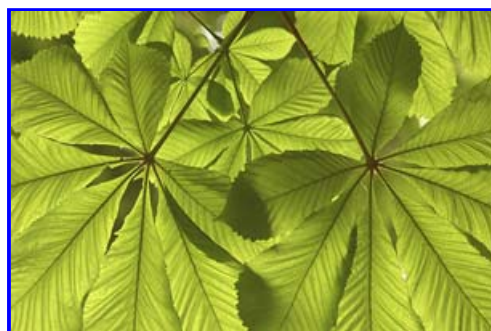
[Chakkaravarthy Chidambareswarapattar, Zachary Larimore, Chariklia Sotiriou-Leventis, Joseph T. Mang and Nicholas Leventis](#)
[J. Mater. Chem., 2010, Advance Article, DOI: 10.1039/C0JM01844A, Paper](#)



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[Aqueous soft matter based photovoltaic devices which mimic leaves and produce electricity](#)

04 Oct 2010



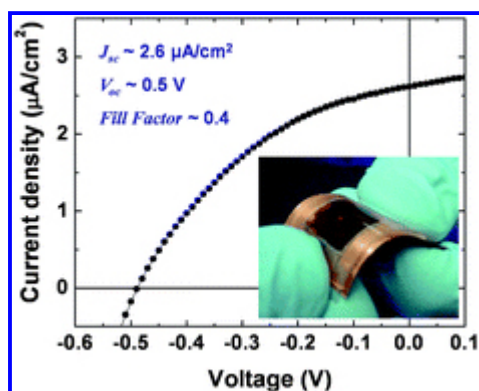
A new type of low-cost, flexible and potentially biocompatible photovoltaic system based on aqueous gel which has the potential for energy generation with minimized environmental pollution has been demonstrated by Orlin D. Velev and colleagues in the USA and South Korea. The article has received widespread media attention including coverage in the ACS' s [Chemical & Engineering News](#).

[Hyung-Jun Koo, Suk Tai Chang, Joseph M. Slocik](#)
[Rajesh R. Naik and Orlin D. Velev*](#)

[J. Mater. Chem., 2011, Advance Article](#)
[DOI: 10.1039/C0JM01820A, Paper](#)

This system consists of two layers of photosensitive ionic dyes infused into a hydrogel which sits between an anode and a cathode. These dyes capture light and work cooperatively to contribute to the photocurrent generating process both on the surface of the working electrode and in the bulk of the gel. It was also demonstrated that carbon-coated Cu electrodes could replace the expensive Pt counter electrodes and reduce the production cost without loss of efficiency.

Biomimetic or biocompatible solar cells, inspired by “artificial leaves” , are a novel class of photovoltaics currently being developed which utilise Chlorophyll and photosynthetic reaction centers (Photosystem I and II). This system allows for facile hosting of these naturally derived photosensitive molecules and shows performance comparable with or higher than those of other biomimetic or ionic photovoltaic systems reported recently.



Professor Velez explains that ‘many photoexcitable molecules generate electricity in the right “asymmetric potential” media – used in many organic cells already, but as our medium is water-based it is particularly useful for bioderived molecules’. However, there are challenges to be solved before these devices can be considered for commercialisation as Professor Velez explains. ‘First, we still have to improve the efficiency of these devices, which is presently very low. Second, we plan to replicate in such devices the ability of the natural leaves to regenerate and replace the organic dye, which will allow us to solve the problems with the long-term stability and performance that are common for all organic photovoltaic devices. We have clear plans how to address both of these challenges and hope to be able to report the results in future publications’ .

This article will be free for the next four weeks! Click [here](#) to access it.

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[Hot articles: rainbow nanoparticles, atomic layer deposition and liquid crystals](#)

01 Oct 2010

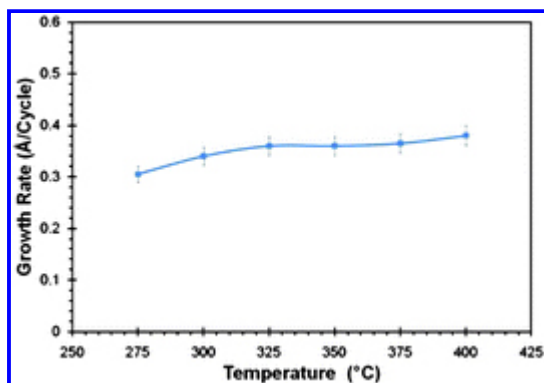
[Synthesis and characterization of tunable rainbow colored colloidal silver nanoparticles using single-nanoparticle plasmonic microscopy and spectroscopy](#)



Tao Huang and Xiao-Hong Nancy Xu*
J. Mater. Chem., 2010, Advance Article
 DOI: 10.1039/C0JM01990A, Paper

Tao Huang and Xiao-Hong Nancy Xu have developed a rapid simple one-pot synthesis method to produce twelve representative colloidal Ag NPs that exhibit rainbow colors, ranging from violet to red (full visible range). They characterized each colloid at single NP resolution and found that the colors of colloids were tunable by controlling the various amounts of sizes and shapes of single NPs. The colloids contained spherical, rod, triangular, and cookie shaped NPs. These single NPs have the potential for use as multicolored optical probes for the study of dynamic events in solutions and living organisms at nm scale in real time.

[Atomic layer deposition of CaB₂O₄ films using bis\(tris\(pyrazolyl\)borate\) calcium as a highly thermally stable boron and calcium source](#)

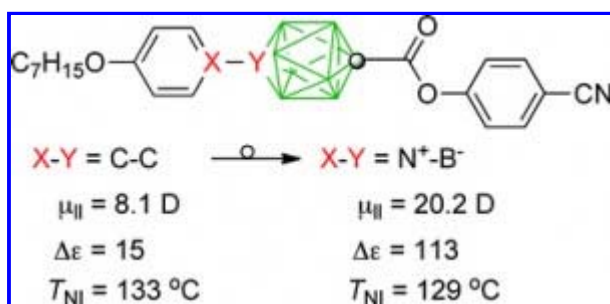


Mark J. Saly, Frans Munnik and Charles H. Winter*

J. Mater. Chem., 2010, Advance Article
 DOI: 10.1039/C0JM02280B, Paper

Materials containing calcium ions have a wide range of applications. Few reports exist of calcium borate-based thin films and there are only a few deposition techniques. Atomic layer deposition (ALD) is an emerging thin film deposition method in which gas phase precursors are introduced stepwise to the substrate and are separated by inert purges. ALD leads to conformal and uniform films with precise thickness control and has been used to coat three dimensional substrates such as nanoparticles, nanotubes, and biotemplates. In this paper, Charles Winter and colleagues report the atomic layer deposition growth of CaB₂O₄ films using the gas phase precursors CaTp₂ and water.

[How much can an electric dipole stabilize a nematic phase? Polar and non-polar isosteric derivatives of \[closo-1-CB₉H₁₀\]⁻ and \[closo-1,10-C₂B₈H₁₀\]](#)



Bryan Ringstrand and Piotr Kaszynski*

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM02876B, Communication

Most liquid crystals of technological importance possess a dipole moment. Typically, change of the molecular dipole moment is associated with alteration of the molecular geometry and conformational dynamics, which themselves affect phase behavior. Recently, Kaszynski and colleagues suggested that the N^+-B^- fragment can serve as an isosteric polar replacement for the C–C fragment in liquid crystalline molecules, having negligible impact on molecular geometry and dynamics thus any change in phase properties being solely to the molecular dipole. In this communication, Bryan Ringstrand and Piotr Kaszynski demonstrate for the first time, experimentally, that the replacement of a C–C fragment with a polar isosteric N^+-B^- fragment leads to 5 pairs of non-polar/polar nematics. Polar nematics, such these are of interest for LCD applications.



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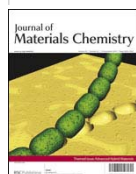
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First published on the web: 20 Oct 2010

[Graphene: learning from carbon nanotubes](#)

Liping Huang, Bin Wu, Gui Yu and Yunqi Liu

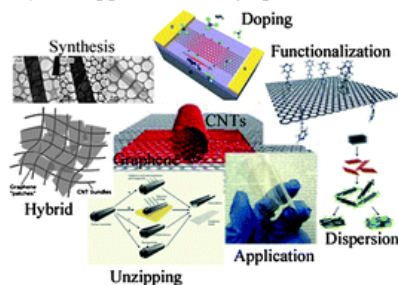
J. Mater. Chem., 2011, Advance Article

DOI: 10.1039/C0JM02225J, Feature

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The knowledge of carbon nanotubes (CNTs) has greatly promoted the synthesis, chemistry and applications of graphene.

[Probing magnetic interactions in columnar phases of a paramagnetic gold dithiolene complex](#)

Romain Perochon, Patrick Davidson, Stéphan Rouzière, Franck Camerel, Lidia Piekara-Sady, Thierry Guizouarn and Marc Fourmigué



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[Soft Matter Blog](#), 15 Oct 2010

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[J. Mater. Chem.](#), 2010, Advance Article

DOI: 10.1039/C0JM02171G, Paper

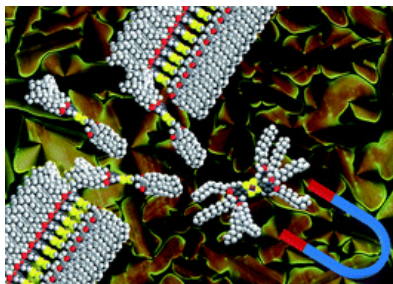


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The extent of magnetic interactions between discotic radical ($S = 1/2$) gold dithiolene complexes, characterized by an extensive spin density delocalization, can be efficiently probed in solid state, liquid crystalline phase and gels.



[High performance n-type organic transistors based on a distyrylthiophene derivative](#)

Jong H. Kim, Jong Won Chung, Yunoh Jung, Seong-Jun Yoon, Byeong-Kwan An, Hyun Sue Huh, Soon W. Lee and Soo Young Park

[J. Mater. Chem.](#), 2010, Advance Article

DOI: 10.1039/C0JM02646H,

Communication

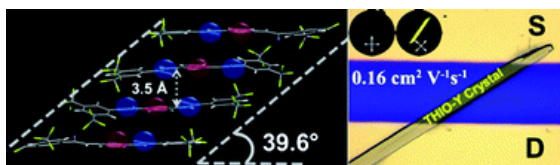


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Single-crystal OFETs based on a distyrylthiophene (DST) derivative, THIO-Y, exhibit an excellent *n*-type performance with a high electron mobility of up to $0.16 \text{ cm}^2 \text{ V}^{-1} \text{ s}^{-1}$ owing to a dense molecular packing and a low LUMO level.



[Size-controlled magnetoliposomes with tunable magnetic resonance relaxation enhancements](#)

Carla J. Meledandri, Tsedev Ninjbadgar and Dermot F. Brougham

[J. Mater. Chem.](#), 2010, Advance Article

DOI: 10.1039/C0JM01061H, Paper



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Magnetic chromatography has been developed as a means to fractionate a coarse suspension of lipid-stabilised clusters of magnetic nanoparticle into fractions of controlled hydrodynamic size and tuneable magnetic resonance properties.



[A novel electrode material based on a highly homogeneous polyaniline/titanium oxide hybrid for high-rate electrochemical capacitors](#)

Xingwei Li, Han Zhang, Gengchao Wang and Zhihui Jiang

[J. Mater. Chem.](#), 2010, Advance Article

DOI: 10.1039/C0JM03330H,

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A highly homogeneous polyaniline/titanium oxide hybrid has been prepared and investigated as an electrode material for electrochemical capacitors, and is found to be promising for high-rate electrochemical capacitive energy storage.



[Dual imaging probes for magnetic resonance imaging and fluorescence microscopy based on perovskite manganese nanoparticles](#)



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Michal Kačenka, Ondřej Kaman, Jan Kotek, Lukáš Falteisek, Jan Černý, Daniel Jirák, Vít Herynek, Klára Zacharovová, Zuzana Berková, Pavla Jendelová, Jaroslav Kupčík, Emil Pollert, Pavel Veverka and Ivan Lukeš

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM01258K, Paper



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La_{0.75}Sr_{0.25}MnO₃ perovskite nanoparticles were encapsulated into a two-ply silica shell providing a dual MR/fluorescence contrast agent suitable for cellular labeling.



[Ultra-narrow WS₂ nanoribbons encapsulated in carbon nanotubes](#)

Zhiyong Wang, Keke Zhao, Hong Li, Zheng Liu, Zujin Shi, Jing Lu, Kazu Suenaga, Soon-Kil Joung, Toshiya Okazaki, Zhaoxia Jin, Zhennan Gu, Zhengxiang Gao and Sumio Iijima

J. Mater. Chem., 2011, Advance Article

DOI: 10.1039/C0JM02821E, Paper



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Zigzag-edged WS₂ nanoribbons with widths down to 1–3 nm and layer numbers of one to three were synthesized *via* chemical reaction in the interior space of carbon nanotubes.



[Low-temperature synthesis of highly hydrophilic Ti-containing mesoporous silica thin films on polymer substrates by photocatalytic removal of structure-directing agents](#)

Yu Horiuchi, Haruhisa Ura, Takashi Kamegawa, Kohsuke Mori and Hiromi Yamashita

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM01404D, Paper

First published on the web: 19 Oct 2010



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A novel preparation method for highly hydrophilic porous thin films *via* photocatalytic removal of a structure-directing agent under UV-light irradiation at ambient temperature without a calcination process.



[Single-step fabrication of non-leaching antibacterial surfaces using vapor crosslinking](#)

Yumin Ye, Qing Song and Yu Mao

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM02578J, Paper



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The single-step vapor crosslinking method produces highly crosslinked polymer coatings with strong non-leaching bactericidal activity on any solid surface.



[Theoretical discussions on electron transport properties of perylene bisimide derivatives with different molecular packings and intermolecular interactions](#)

Yun Geng, Jianping Wang, Shuixing Wu, Haibin Li, Fei Yu, Guochun Yang, Hongze Gao and Zhongmin Su

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM02119A, Paper

First published on the web: 18 Oct 2010



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Different substituents induce different compounds, and thus different crystalline packing styles, which induces different transport properties.





[High performance ultraviolet photodetectors based on an individual Zn₂SnO₄ single crystalline nanowire](#)

YanJun Zhang, JianJun Wang, Hongfei Zhu, Hui Li, Li Jiang, Chunying Shu, Wenping Hu and Chunru Wang

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM02872J,

Communication



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Ultraviolet photodetectors based on an individual Zn₂SnO₄ nanowire with high “ON/OFF” current ratio, high response speed and excellent stability.



[Development of organic field-effect properties by introducing aryl-acetylene into benzodithiophene](#)

Qing Meng, Lang Jiang, Zhongming Wei, Chengliang Wang, Huaping Zhao, Hongxiang Li, Wei Xu and Wenping Hu

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM02895A,



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Ethynylene-containing benzo[1,2-*b*:4,5-*b'*]dithiophene derivatives 1a–c (BPEBDT, BTEBDT and BHPEBDT) were designed and synthesized. Their physicochemical properties were studied by absorption spectra and electrochemistry. 1a–c displayed high field-effect transistors performance, a mobility up to 1.17 cm² V⁻¹ s⁻¹ with on/off current ratio of 10⁷ was achieved.



[“Direct” grafting of linear macromolecular “wedges” to the edge of pristine graphite to prepare edge-functionalized graphene-based polymer composites](#)

Eun-Kyoung Choi, In-Yup Jeon, Se-Jin Oh and Jong-Beom Baek

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM01728K,



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The edges of pristine graphite was covalently grafted with *para*-poly(ether-ketone) (*p*PEK) and the resulting *p*PEK grafted graphite displayed profoundly improved mechanical properties.



[Integration of self-assembled discotic-based fibres into field-effect transistors: a comparison of preparation approaches](#)

Rebecca C. Savage, Jeffrey M. Mativetsky, Emanuele Orgiu, Matteo Palma, Gabin Gbabode, Yves H. Geerts and P. Samori

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM01754J,



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We present a comparative study, using various methods to prepare supramolecular fibres for OFET devices, with a triphenylene derivative as model system.



[Hydrothermal synthesis and catalysis of Nb₂O₅-WO₃ nanofiber crystal](#)

Kazu Okumura, Takuya Tomiyama, Shuhei Shirakawa, Soichiro Ishida, Takashi Sanada, Masazumi Arai and Miki Niwa

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM02882G,



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Nb₂O₅-WO_x synthesized by a hydrothermal method having a long nanocrystalline structure exhibited a high catalytic activity in Friedel-Crafts reactions.



[Rapid and scalable route to CuS biosensors: a microwave-assisted Cu-complex transformation into CuS nanotubes for ultrasensitive nonenzymatic glucose sensor](#)

Jun Liu and Dongfeng Xue

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM01714K, Paper



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A microwave-assisted Cu-complex transformation strategy has been developed for controllable production of CuS nanotubes for use as a ultrasensitive nonenzymatic glucose sensor.



[O₂ plasma-activated CuO-ZnO inverse opals as high-performance methanol microreformer](#)

Yan-Gu Lin, Yu-Kuei Hsu, San-Yuan Chen, Li-Chyong Chen and Kuei-Hsien Chen

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM02605K,
Communication



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Our key strategy in this work is to fabricate 3DOM nanoarchitectures in a microreactor consisting of macropores as well as mesopores to ensure a high surface area, and generation of oxygen vacancies (V_o) through O₂-plasma treatment to produce additional active entities for methanol reforming reaction (MRR).



[A morphology controller for high-efficiency bulk-heterojunction polymer solar cells](#)

Bogyu Lim, Jang Jo, Seok-In Na, Juhwan Kim, Seok-Soon Kim and Dong-Yu Kim

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM02296A, Paper



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To control the morphology, we synthesized a hydrophobic end-functionalized P3HT (F-P3HT) to induce hydrophilic-hydrophobic repulsions interactions in the boundary between the relatively hydrophilic PCBM and the relatively hydrophobic P3HT. F-P3HT thus provides a maximized continuous interfacial area between the donor and the acceptor as well as bi-continuous networks of donor and acceptor domains, resulting in better percolation pathways for charge transport.



[Thermal plasma synthesis of tungsten bronze nanoparticles for near infrared absorption applications](#)

Marc Mamak, Sung Yeun Choi, Urs Stadler, Richard Dolbec, Maher Boulos and Srebri Petrov

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM02169E,
Communication



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The high throughput production of tungsten bronze nanoparticles with high purity and tunable composition was achieved by thermal plasma synthesis.



[Searching insight into the atomistic structure of SiCO ceramics](#)

Peter Kröll

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM01583K, Paper



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Models support that during structure genesis of amorphous SiCO ceramics the excess carbon separates completely from the glass matrix, while SiC clusters precipitate within the residual SiCO glass.



[The return of photoelastic stress measurements: utilizing birefringence to monitor damage and repair in healable materials](#)

Erin B. Murphy

J. Mater. Chem., 2011, Advance Article

DOI: 10.1039/C0JM02308F, Paper



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We utilize birefringence to assess damage and extent of repair in healable polymers based on the thermally reversible Diels–Alder reaction.



[Dramatic reduction of the oxygen vacancy formation energy in ceria particles: a possible key to their remarkable reactivity at the nanoscale](#)

Annapaola Migani, Georgi N. Vayssilov, Stefan T. Bromley, Francesc Illas and Konstantin M. Neyman

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM01908A, Paper



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Calculated oxygen vacancy formation energies $E(O_{vac})$ of ceria particles are strongly reduced with increasing size up to 2 nm, suggesting the existence of an $E(O_{vac})$ minimum before the bulk scale is reached.



[Ratiometric and reusable fluorescent nanoparticles for Zn²⁺ and H₂PO₄⁻ detection in aqueous solution and living cells](#)

Chunsheng He, Weiping Zhu, Yufang Xu, Ye Zhong, Juan Zhou and Xuhong Qian

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM01925A, Paper



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Fluorescent nanoparticles can be repeatedly used to ratiometrically detect Zn²⁺ and H₂PO₄⁻ in aqueous solution and living cells.



[Effect of transition metal \(M = Co, Ni, Cu\) substitution on electronic structure and vacancy formation of Li₃N](#)

Shunnian Wu, Zhili Dong, Ping Wu and Freddy Boey

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM01883J, Paper



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Electron back donation by nitrogen to Co/Ni reduces their oxidation states, thus reduces vacancies required for charge compensation.



[Polymeric entrapped thiol-coated gold nanorods: cytotoxicity and suitability as molecular optoacoustic contrast agent](#)

Mauro Comes Franchini, Jessica Ponti, Robert Lemor, Marc Fournelle, Francesca Broggi and Erica Locatelli

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM02209H, Paper



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In vitro cytotoxicity of GNRs-2-PNPs was studied on immortalized mouse fibroblasts and the results showed a dose-effect relationship. Phantom experiments have proven that the polymer coating doesn't hinder the GNRs from having unique optical properties which allow their usage for both classical and multispectral optoacoustic imaging.



[Synthesis of sea-urchin shaped \$\gamma\$ -MnO₂ nanostructures and their application in lithium batteries](#)

Jing Hui Zeng, Ye Feng Wang, Yi Yang and Jing Zhang

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM01711F, Paper



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Sea-urchin shaped γ -MnO₂ hierarchical structure has been synthesized using a facile hydrothermal method without employing any template or surfactant with mild conditions for use as cathode materials in lithium-ion batteries.



[Solvent additives and their effects on blend morphologies of bulk heterojunctions](#)

Teddy Salim, Lydia Helena Wong, Björn Bräuer, Roopali Kukreja, Yong Lim Foo, Zhenan Bao and Yeng Ming Lam

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM01976C, Paper



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Both the boiling point of the additives and the interaction energies are important in controlling the nanomorphology of a blend film. PCE as high as 3.1% can be achieved in an optimally phase-separated blend due to an improvement in the charge dissociation and a decrease in bimolecular recombination.



[Fluorescence turn-on assay for glutathione reductase activity based on a conjugated polyelectrolyte with multiple carboxylate groups](#)

Hongliang Fan, Tao Zhang, Shaowu Lv and Qinhan Jin

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM02400G, Paper



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A multi-carboxylate CPE has been designed as a highly specific Cu²⁺ probe, which facilitates the sensitive assay of GR activity.



[Subwavelength Si nanowire arrays for self-cleaning antireflection coatings](#)

Yu-An Dai, Hung-Chih Chang, Kun-Yu Lai, Chin-An Lin, Ren-Jei Chung, Gong-Ru Lin and Jr-Hau He

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM00524J, Paper



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Si nanowire arrays with enhanced antireflective and self-cleaning properties.



[Luminescent metastable Y₂WO₆:Ln³⁺ \(Ln = Eu, Er, Sm, and Dy\) microspheres with controllable morphology via self-assembly](#)

Jiao Wang, Zhi-Jun Zhang, Jing-Tai Zhao, Hao-Hong Chen, Xin-Xin Yang, Ye Tao and Yan Huang

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM01814G, Paper



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Novel multi-color luminescent metastable Ln³⁺-doped Y₂WO₆ microspheres with controllable morphologies were successfully prepared by a simple hydrothermal method *via* nano-particles self-assembly.



[Quantifying the relationship between interface chemistry and metal electronegativity of metal–semiconductor interfaces](#)

Ping Wu and Yingzhi Zeng

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM01731K, Paper



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Consistent with the quasi-chemical model, a nonlinear relationship between the interface chemistry and the metal electronegativity is quantified, which provides an opportunity for investigating the formation mechanism of Schottky barrier.



[First-principles study of the mechanism of ethylene epoxidation over Ag–Cu particles](#)

Simone Piccinin, Ngoc Linh Nguyen, Catherine Stampfl and Matthias Scheffler

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM01916J, Paper

First published on the web: 15 Oct 2010



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We model theoretically the mechanism ethylene epoxidation on several CuO thin oxide-like surface structures.



[Improved visible light photocatalytic activity of titania doped with tin and nitrogen](#)

Enjun Wang, Tao He, Lusong Zhao, Yongmei Chen and Yaan Cao

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM02539A, Paper



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Co-doping of nitrogen and tin into titania can greatly enhance the photocatalytic activity under both visible and UV-light irradiation.



[A general method for faithful replication of keratin fibers with metal oxides](#)

Juan He, Zhong-Wen Liu, Wei-Bin Fan, Zhao-Tie Liu, Jian Lu and Jianguo Wang

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM03068F, Communication



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An easily controlled surface precipitation approach using an inorganic metal salt as a precursor is developed to faithfully replicate micro-fibrous oxides from keratin fibers. SEM images show that hollow alumina fibers

are precisely replicated from chicken feathers on the macro- and nano-scales.



[Polymerisation of S₂N₂ to \(SN\)_x as a tool for the rapid imaging of fingerprints removed from metal surfaces](#)

Stephen M. Bleay, Paul F. Kelly and Roberto S. P. King

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM02724C,

Communication



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Rapid chemical imaging of fingerprints which have been removed from metal surfaces can now be achieved *via* the interaction of S₂N₂ with the prints' corrosion signatures.

First published on the web: 13 Oct 2010



[Structural study on inorganic/organic hybrid composite membranes](#)

Uma Thanganathan

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM02504F, Paper



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New inorganic/organic hybrid composite membranes with a network structure of metal alkoxides, heteropolyacids and glutaraldehyde have been prepared and their proton conductivity and thermal and mechanical properties have been investigated.



[Post-synthetic modification of the metal-organic framework compound UiO-66](#)

Mathivathani Kandiah, Sandro Usseglio, Stian Svelle, Unni Olsbye, Karl Petter Lillerud and Mats Tilset

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM02416C,

Communication



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It is demonstrated that it is possible to perform covalent post-synthetic modifications of the UiO-66-NH₂ MOF by using four different acid anhydrides. FT-IR is employed to monitor the reactions, and the extent of reaction depends on the bulkiness of the anhydrides. For the smallest one, acetic anhydride, 100% conversion to UiO-66-NHCOCH₃ was observed.



[Polystyrene sphere-assisted one-dimensional nanostructure arrays: synthesis and applications](#)

Liang Li, Tianyou Zhai, Haibo Zeng, Xiaosheng Fang, Yoshio Bando and Dmitri Golberg

J. Mater. Chem., 2011, Advance Article

DOI: 10.1039/C0JM02230F, Feature

Article



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This paper reviews recent developments in the synthetic strategies and unique applications of one-dimensional (1D) nanostructure arrays based on polystyrene (PS) spheres.



[Fast-heating-vapor-trapping method to aligned indium oxide bi-crystalline nanobelts arrays and their electronic properties](#)

Guozhen Shen and Di Chen

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM02189J, Paper



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By using a fast-heating-vapor-trapping (FHVT) method, we successfully synthesized aligned bi-crystalline In_2O_3 nanobelts arrays, which exhibited typical n-type transistor performance and showed a decent response to UV light exposure.

First published on the web: 12 Oct 2010



[Processable donor–acceptor type electrochromes switching between multicolored and highly transmissive states towards single component RGB-based display devices](#)

Abidin Balan, Derya Baran and Levent Toppare

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM01815E, Paper



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Spray processable, p and n dopable polymers switching between multicolor and transparent states for single component RGB based display devices.



[Synthesis of walnut-like hierarchical structure with superhydrophobic and conductive properties](#)

Nina Jiang, Yiting Xu, Ning He, Jiangfeng Chen, Yuanming Deng, Conghui Yuan, Guobin Han and Lizong Dai

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM01705A, Paper



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The walnut-like hierarchical structure, having good conductive and superhydrophobic properties, was fabricated through “competitive adsorption–restricted polymerization”.



[Effect of manganese doping on Li-ion intercalation properties of \$\text{V}_2\text{O}_5\$ films](#)

D. M. Yu, S. T. Zhang, D. W. Liu, X. Y. Zhou, S. H. Xie, Q. F. Zhang, Y. Y. Liu and G. Z. Cao

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM01252A, Paper

First published on the web: 11 Oct 2010



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Mn-doped V_2O_5 films prepared by a simple H_2O_2 - V_2O_5 sol–gel process with the direct addition of manganese salt exhibit excellent cyclic stability with a fading rate of less than 0.06% per cycle, significantly better than that of the pure V_2O_5 films, and with a large discharge capacity of ~283mAh/g at a current density of 68 mA/g, again much higher than that of V_2O_5 films.



[Anomalous Eu layer doping in Eu, Si co-doped aluminium nitride based phosphor and its direct observation](#)

Takashi Takeda, Naoto Hirosaki, Rong-Jun Xie, Koji Kimoto and Mitsuhiro Saito

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM02096F, Paper



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HAADF-STEM image of Eu, Si co-doped AlN phosphor. Bright segments show Eu single layer occupation.



[Facile synthesis of mesoporous N doped zirconium titanium mixed oxide nanomaterial with enhanced photocatalytic activity under visible light](#)

Noor Aman, Trilochan Mishra, Ranjan K. Sahu and J. P. Tiwari

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM01342K, Paper

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Hydrazine mediated synthesized N-doped mesoporous (298 m²/g) titanium zirconium oxide can efficiently reduce Se(VI) to Se⁰ under visible light.



[A DFT exploration of the organization of thiols on Au\(111\): a route to self-assembled monolayer of magnetic molecules](#)

Gopalan Rajaraman, Andrea Caneschi, Dante Gatteschi and Federico Totti

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM02481C, Paper

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We have employed periodic DFT to study the energetics, structure, bonding and magnetic exchange of SAMs of nitronyl nitroxide radical thiols on Au(111), revealing the non-innocent nature of the gold surface.



[High photo- and electroluminescence efficiencies of ladder-like structured polysilsesquioxane with carbazole groups](#)

Seung-Sock Choi, He Seung Lee, Seung Sang Hwang, Dong Hoon Choi and Kyung-Youl Baek

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM02561E,

Communication

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Ladder-like structured polysilsesquioxane with carbazole groups showed unexpected high photo- and electroluminescence efficiencies both in solution and solid states due to its rigid silicone ladder structures, which efficiently isolated the carbazole groups and thus suppressed their excimer formations by inter- and intramolecules.



[Synthesis, crystallization, electrochemistry and single crystal X-ray analysis of a methoxy-substituted-tris-phenalenyl based neutral radical](#)

Arindam Sarkar, Fook S. Tham and Robert C. Haddon

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM02397C, Paper

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Synthesis, crystallization, electrochemistry, X-ray structure and electron density distribution of a methoxy-substituted-tris-phenalenyl neutral radical have been reported.



[Synthesis of CuO/graphene nanocomposite as a high-performance anode material for lithium-ion batteries](#)

Bao Wang, Xing-Long Wu, Chun-Ying Shu, Yu-Guo Guo and Chun-Ru Wang

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM01941K, Paper

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An optimized nanostructure design for electrode materials for high-performance lithium-ion batteries was realized by introducing three-dimensional graphene networks into CuO nanomicrostructures.



[Compositional and structural control of tenebrescence](#)

First published on the web: 09 Oct 2010

Edward R. Williams, Andrew Simmonds, Jennifer A. Armstrong and Mark T. Weller

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM02066D, Paper



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The reversible, UV induced, photochromism of materials with the sodalite structure may be controlled by varying their composition and thus the size of the cage containing the photo-excited electron.



[Synthesis and catalytic behavior of tetrakis\(4-carboxyphenyl\) porphyrin-periodic mesoporous organosilica](#)

Eun-Young Jeong, Abhishek Burri, Seung-Yeop Lee and Sang-Eon Park

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM02591G, Paper



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An efficient protocol for synthesis of porphyrin based tetra organo silsesquioxane bridged periodic mesoporous organosilicas is described.



[Synthesis of highly nitrogen-doped hollow carbon nanoparticles and their excellent electrocatalytic properties in dye-sensitized solar cells](#)

Rongrong Jia, Jiazang Chen, Jianghong Zhao, Jianfeng Zheng, Chang Song, Li Li and Zhenping Zhu

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM01799J, Paper



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Highly nitrogen-doped hollow carbon nanoparticles were synthesized without using metal catalysts and exhibited excellent electrocatalytic activity in dye-sensitized solar cells.



[Individual nanocomposite sheets of chemically reduced graphene oxide and poly\(N-vinyl pyrrolidone\): preparation and humidity sensing characteristics](#)

Jiali Zhang, Guangxia Shen, Wanjun Wang, Xuejiao Zhou and Shouwu Guo

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM02440F, Paper



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Individual CRG/PVP nanocomposite sheets were prepared through a facile one-pot approach. The as-obtained CRG/PVP sheets have a high water adsorption capability, and show humidity-dependent electrical conductivity.



[Surfactant additives for improved photovoltaic effect of polymer solar cells](#)

Byoungchoo Park, Yoon Ho Huh and Mina Kim

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM02091E, Paper



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A polymer photovoltaic system mixed with a nonionic 'surfactant additive' is proposed for the realization of efficient exciton dissociation.

First published on the web: 08 Oct 2010



[Liquid crystalline phases and demixing in binary mixtures of shape-anisometric colloids](#)

Stavros D. Peroukidis, Alexandros G. Vanakaras and Demetri J. Photinos

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM01692F, Paper



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A theoretical model of anisometric particles is presented and used to explore the mesomorphic behavior of binary mixtures combining spherical, rod-like and plate-like particles.



[Initial permeability of percolative PbTiO₃/NiFe₂O₄ composite ceramics by a sol-gel *in situ* process](#)

Xuhui Zhang, Lu Zhu, Yanling Dong, Wenjian Weng, Gaorong Han, Ning Ma and Piyi Du

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM01506G, Paper



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The initial permeability behavior of the PTO/NFO composite ceramics is believably dependent on the new revised BH and MG models



[Optimizing reaction conditions for synthesis of electron donor-\[60\]fullerene interlocked multiring systems](#)

Jackson D. Megiatto Junior, Robert Spencer and David I. Schuster

J. Mater. Chem., 2011, Advance Article

DOI: 10.1039/C0JM02154G, Paper



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A powerful and versatile new methodology has been developed for the preparation of nanoscale photoactive interlocked structures with appended [60]fullerene groups.



[Physically crosslinked fluorosilicone elastomers obtained by self-assembly and template polycondensation of tailored building blocks](#)

Claire Longuet, Amédée Ratsimihety, Sébastien André, Gilles Boutevin, Francine Guida-Pietrasanta, Brigitte Decamps, Michel Ramonda, Christine Joly-Duhamel, Bernard Boutevin and François Ganachaud

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM01519A, Paper



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Self-assembly and template polycondensation of specific fluorinated oligocarbosiloxanes generated physically crosslinked elastomer-like materials with noteworthy mechanical properties.



[Highly efficient blue OLED based on 9-anthracene-spirobenzofluorene derivatives as host materials](#)

Myoung-Seon Gong, Hyun-Seok Lee and Young-Min Jeon

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM00593B, Paper



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Blue OLEDs with the configuration ITO/DNTPD/NPB/host : 5% dopant/Alq₃/Al-LiF were prepared from the three host materials doped with DSA-Ph and BD-6MDPA dopants and the device composed of BH-9PA doped with DSA-Ph and BD-6MDPA showed blue EL spectra at 468 and 464 nm at 7 V and luminance efficiencies of 7.03 and 6.60 cd A⁻¹, respectively.



First published on the web: 07 Oct 2010



First published on the web: 06 Oct 2010



[Ion exchange in the charge-balancing sites of aluminosilicate inorganic polymers](#)

Sean J. O'Connor, Kenneth J. D. MacKenzie, Mark E. Smith and John V. Hanna

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM01254H, Paper



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Antimicrobial action on *Staphylococcus aureus* of Ag-exchanged inorganic polymer prepared by the new synthesis described in this paper (left) compared with the control sample of the Na precursor compound (right).



[Highly stabilized luminescent polymer nanocomposites: fluorescence emission from metal quinolate complexes with inorganic nanocrystals](#)

Takeshi Otsuka and Yoshiki Chujo

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM01684E, Paper



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8-Hydroxyquinoline moieties immobilized between organic and inorganic components imitating a sandwich like structure can provide novel functional materials featuring high luminescent stability and durability, and good thermal stability.



[Thermodynamics and structures of oxide crystals by a systematic set of first principles calculations](#)

Isao Tanaka, Atsushi Togo, Atsuto Seko, Fumiyasu Oba, Yukinori Koyama and Akihide Kuwabara

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM01932A, Feature

Article



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Combining DFT calculations with statistical thermodynamics through phonon calculations and cluster expansion technique, thermo-chemical information as well as structure and properties of as-yet-unknown crystals can be obtained.



[Heterobimetallic Ba–Co aminopolycarboxylate complexes as precursors for BaCoO_{3-δ} oxides: towards a one-stage-deposition of cobaltite films](#)

Ion Bulimestru, Olivier Mentré, Nathalie Tancret, Aurélie Rolle, Nora Djelal, Laurence Burylo, Nicoleta Cornei, Nelea Popa and Aurelian Gulea

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM01012J, Paper



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We show the preparation of the oxide 2H-BaCo^{IV}O₃ from Ba–Co heterobimetallic complexes and the possible deposition of porous cobaltite layers on dense substrate in a single simultaneous reaction/deposition stage.



[Direct white light emission from inorganic–organic hybrid semiconductor bulk materials](#)

Wooseok Ki, Jing Li, Goki Eda and Manish Chhowalla

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM02213F, Paper



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Double-layer Te substituted 2D-[Cd₂Se₂(ba)] hybrid semiconductors emit direct white light upon illumination of UV-LED.



[Enhanced photovoltaic response by incorporating polyoxometalate into a phthalocyanine-sensitized electrode](#)

Yaobin Yang, Lin Xu, Fengyan Li, Xiguang Du and Zhixia Sun

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM01812K, Paper



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The introduction of P₂Mo₁₈ into CoTAPc electrodes is an effective approach to enhance their photovoltaic response.



[Tuning of electronic properties and rigidity in PEDOT analogs](#)

Yair Haim Wijsboom, Yana Sheynin, Asit Patra, Natalia Zamoshchik, Ran Vardimon, Gregory Leitus and Michael Bendikov

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM02679D,

Communication



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While the band gaps of the polyselenophenes P1–P3 are ~1.4 eV, the orbital energy levels vary significantly because of changes in the electronic nature of the peripheral ring and the peak-width of the absorbance spectrum varies because of changes to backbone rigidity.



[Gas phase synthesis of titania with aerogel character and its application as a support in oxidation catalysis](#)

Stefan Dilger, Christian Hintze, Michael Krumm, Carlos Lizandara-Pueyo, Salem Deeb, Sebastian Proch and Sebastian Polarz

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM00769B, Paper



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Aerogel-like TiO₂ has been prepared *via* aerosol synthesis and could be applied as new model systems in oxidation catalysis.



[A molecular simulation approach to the prediction of the morphology of self-assembled nanoparticles in diblock copolymers](#)

Paola Posocco, Zbyšek Posel, Maurizio Fermeiglia, Martin Lísal and Sabrina Pricl

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM01561J, Paper



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In this work we apply *Dissipative Particle Dynamics* simulations to predict the distribution of gold nanoparticles with different degree of functionalization and volume fraction in a lamellar microsegregated copolymer template.

First published on the web: 04 Oct 2010



[Characterization of the gel phases formed in the synthesis of microporous gallophosphate, cloverite](#)

Zhimin Yan, Chris W. Kirby and Yining Huang

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM02670K, Paper



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Characterization of the gel phases formed in microporous material cloverite synthesis.



[Highly selective immobilization of amoxicillin antibiotic on carbon nanotube modified electrodes and its antibacterial activity](#)

Annamalai Senthil Kumar, Sundaram Sornambikai, Lakshmiathy Deepika and Jyh-Myng Zen

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM02262D, Paper



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Selective electrochemical immobilization and enhanced antibacterial activity of a β -lactam antibiotic, amoxicillin over penicillin and ampicillin, on MWNT modified electrodes was achieved.



[Preparation of unique PEDOT nanorods with a couple of cusped tips by reverse interfacial polymerization and their electrocatalytic application to detect nitrite](#)

Hui Mao, Xincui Liu, Danming Chao, Lili Cui, Yongxin Li, Wanjin Zhang and Ce Wang

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM01745K, Paper



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By using $\text{Ce}(\text{SO}_4)_2 \cdot 4\text{H}_2\text{O}$ as an oxidant and sodium bis(2-ethylhexyl) sulfosuccinate (AOT) as a surfactant, unique poly(3,4-ethylenedioxythiophene) (PEDOT) nanorods with a couple of cusped tips were successfully prepared by reverse interfacial polymerization and they act as a good steady and sensitive electrode material for detecting nitrite.



[A density functional theory study of \$\text{CO}_2\$ and \$\text{N}_2\$ adsorption on aluminium nitride single walled nanotubes](#)

Yan Jiao, Aijun Du, Zhonghua Zhu, Victor Rudolph and Sean C. Smith

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM01416H, Paper



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Activation of carbon dioxide by aluminium nitride single wall nanotubes.



[Iron\(II\) tetrakis\(diaqua\)platinum octacarboxyphthalocyanine supported on multi-walled carbon nanotube platform: an efficient functional material for enhancing electron transfer kinetics and electrocatalytic oxidation of formic acid](#)

Solomon A. Mamuru, Kenneth I. Ozoemena, Takamitsu Fukuda and Nagao Kobayashi

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM02210A, Paper



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Novel Pt-based iron(II) phthalocyanine complex supported on MWCNT-based electrode exhibits enhanced kinetics and electrocatalysis towards the oxidation of formic acid.



[Metallic coordination supramolecule, \$\[\text{Cu}\(\text{I}\)\text{Cl}_{0.7}\text{Br}_{1.3}\(\text{pyra-TTF}\)^{0.5+}\]\$](#)

Shun Ichikawa, Kazuyuki Takahashi, Masaki Matsuda, Hiroyuki Tajima and Hatsumi Mori

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM01318H, Paper



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A supramolecular copper complex, $[\text{Cu}(\text{I})\text{Cl}_{0.2}\text{Br}_{1.3}(\text{pyra-TTF})^{0.5+}]$ (pyra-TTF = pyrazino-tetrathiafulvalene), was coordinated by disordered mixed halide anions and assembled conducting donor ligands.



[Functional nanocomposites based on the infusion or *in situ* generation of nanoparticles into amphiphilic epoxy gels](#)

Ana Ledo-Suárez, Julieta Puig, Ileana A. Zucchi, Cristina E. Hoppe, María L. Gómez, Roberto Zysler, Carlos Ramos, M. Claudia Marchi, Sara A. Bilmes, Massimo Lazzari, M. Arturo López-Quintela and Roberto J. J. Williams

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM01421D, Paper



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An amphiphilic epoxy gel was employed for the infusion or *in situ* generation of metallic, luminescent or magnetic nanoparticles.



[Structural evolution of layered \$\text{Li}_{1.2}\text{Ni}_{0.2}\text{Mn}_{0.6}\text{O}_2\$ upon electrochemical cycling in a Li rechargeable battery](#)

Jihyun Hong, Dong-Hwa Seo, Sung-Wook Kim, Hyeokjo Gwon, Song-Taek Oh and Kisuk Kang

J. Mater. Chem., 2010, Advance Article

DOI: 10.1039/C0JM01971B, Paper



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The original layered $\text{Li}_{1.2}\text{Ni}_{0.2}\text{Mn}_{0.6}\text{O}_2$ evolves to a structure where the spinel-like region is locally embedded in the layered framework during cycling.



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