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IN THIS ISSUE

ISSN 1144-0546 CODEN NJCHES 31(5) 601-772 (2007)



Cover

See Jonathan L. Sessler, Natalie M. Barkey, G. Dan Pantos and Vincent M. Lynch, New J. Chem., 2007, 31, 646. Like the Hydra of old, the psychedelic Antarctic octopus (Paraledone turqueti) is a monster capable of grabbing its victim using multiple interactions. The same is true for the new anion receptor described by Sessler et al. We thank Elaina Jorgensen of the U.S. National Oceanic & Atmospheric Administration for kindly providing us with the image of the octopus.

CHEMICAL SCIENCE

C33

Drawing together the research highlights and news from all RSC publications, *Chemical Science* provides a 'snapshot' of the latest developments across the chemical sciences showcasing newsworthy articles, as well as the most significant scientific advances.

Chemical Science

May 2007/Volume 4/Issue 5 www.rsc.org/chemicalscience

EDITORIAL

617

Introduction to the special issue in honour of George Gokel

A collection of papers dedicated to George Gokel on the occasion of his 60th birthday.



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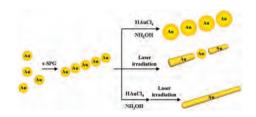
LETTERS

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New approach to preparing one-dimensional Au nanowires utilizing a helical structure constructed by schizophyllan

Ah-Hyun Bae, Munenori Numata, Sunao Yamada and Seiji Shinkai*

We studied the transformation of 1D Au nanoparticles created with the aid of SPG into Au nanowires, expecting SPG to act not only as a 1D template for preorganization of Au nanoparticles but also for facilitation of Au nanoparticle fusion.

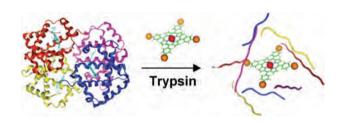


623

Denaturation and accelerated proteolysis of sizeable heme proteins by synthetic metalloporphyrins

Steven Fletcher and Andrew D. Hamilton*

A synthetic, copper porphyrin unwinds the α -helical domains of the heme proteins hemoglobin, myoglobin and cytochrome c, thereby catalyzing trypsin-mediated proteolysis.

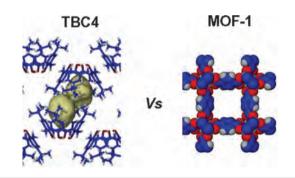


628

Comparison of porous and nonporous materials for methane storage

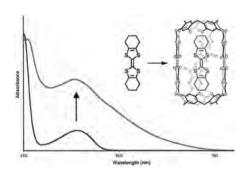
Praveen K. Thallapally,* Karen A. Kirby and Jerry L. Atwood*

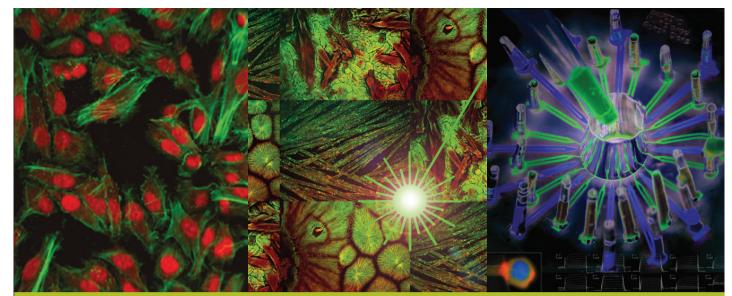
Sublimed, low-density *p-tert*-butylcalix[4]arene absorbs methane more readily at room temperature and 1 atm pressure than do either single wall carbon nanotubes (SWNT) or a comparative porous metal-organic framework (MOF-1).



Charge transfer and encapsulation in a synthetic, self-assembled receptor

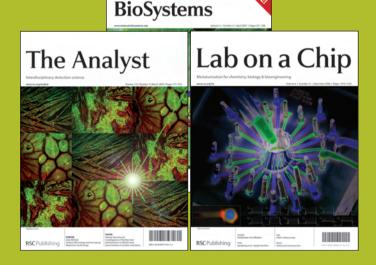
Hillary Van Anda, Andrew J. Myles and Julius Rebek, Jr* Tetrathiafulvalene derivatives show charge transfer and exceptional binding within a self-assembled molecular capsule.





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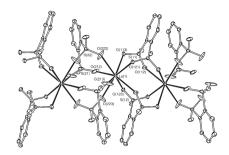
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Structural versatility in hydrated rare earth(III) 1.2-benzenedisulfonates

Glen B. Deacon,* Rita Harika, Peter C. Junk, Brian W. Skelton and Allan H. White

Mononuclear and polymeric species arise from lanthanoid 1,2-benzenedisulfonate interactions. In all structures, hydrogen-bonding involving water of crystallization links the cations and the anions in a supramolecular superstructure.

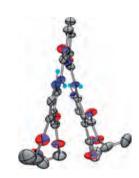


646

Acyclic pyrrole-based anion receptors: design, synthesis, and anion-binding properties

Jonathan L. Sessler,* Natalie M. Barkey, G. Dan Pantos and Vincent M. Lynch

A series of novel, acyclic pyrrole-based anion receptors is described that bind nitrite and carboxylate anions with good selectivity in dichloroethane solution.

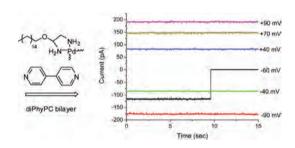


655

Long-lived and highly conducting ion channels formed by lipophilic ethylenediamine palladium(II) complexes

Thomas M. Fyles* and Christine C. Tong

An ethylenediamine palladium complex forms very long-lived and highly conducting channels in bilayer membranes.

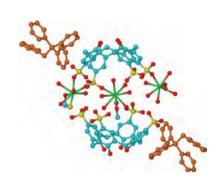


662

Controlling the interplay of large organic ions: para-sulfonato-calix[4]arene and phosphonium cations

Mohamed Makha,* Yatimah Alias, Colin L. Raston* and Alexandre N. Sobolev

Materials based on polyanionic *para*-sulfonato-calix[4]arene and tetraphenylphosphonium (Ph_4P^+) or benzyltriphenylphosphonium $(BzPh_3P^+)$ cations are built up *via* partial inclusion and extensive phenyl embracing in association with trivalent cations $(Yb^{3+}, Gd^{3+} \text{ and } Er^{3+})$.



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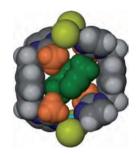
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The solvent-templating effect as the driving factor that influences the formation of crystalline materials based on the stacking of metallocycles

Liliana Dobrzańska, Gareth O. Lloyd and Leonard J. Barbour*

Depending on factors such as solvent size and shape, and solvent-complex interactions, a variety of ring conformations and coordination polymers are observed for the same set of complexing components.

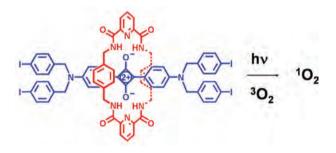


677

Singlet oxygen generation using iodinated squaraine and squaraine-rotaxane dves

Easwaran Arunkumar, Pallikkara K. Sudeep, Prashant V. Kamat, Bruce C. Noll and Bradley D. Smith*

The aggregation and photophysical properties of an iodinated squaraine dye and analogous squaraine-rotaxane are compared; the squaraine-rotaxane system is much more resistant to photobleaching and thus is a more effective singlet oxygen photosensitizer.

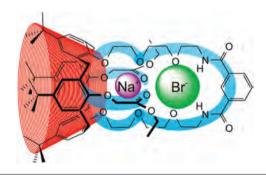


684

Tuning the strength and selectivity of ion-pair recognition using heteroditopic calix[4]arene-based receptors

Michael D. Lankshear, Ian M. Dudley, Kar-Man Chan and Paul D. Beer*

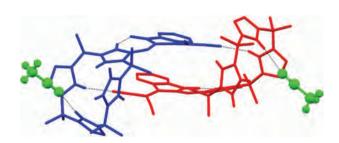
The fine tuning of selectivity and strength of cooperative ion-pair recognition using heteroditopic calix[4]arene-based receptors has been achieved. These modulations in binding properties are found to depend critically on the cation binding site and the macrocyclic nature of the receptors.



Anion recognition by N-confused calix[4]pyrrole-αcarbaldehyde and its Knoevenagel reaction derivatives

Wim Dehaen,* Philip A. Gale,* Sergio E. García-Garrido, Maarten Kostermans and Mark E. Light

The synthesis of a N-confused calix[4]pyrrole- α -carbaldehyde is reported, together with its Knoevenagel reaction derivatives.





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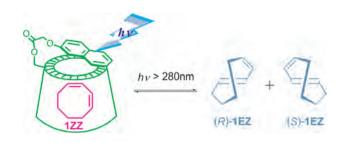
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Supramolecular enantiodifferentiating photoisomerization of (Z,Z)-1,3-cyclooctadiene included and sensitized by naphthalene-modified cyclodextrins

Cheng Yang, Tadashi Mori, Takehiko Wada and Yoshihisa Inoue*

Supramolecular complexation of naphthalene-modified cyclodextrins with (Z,Z)-1,3-cyclooctadiene (1**ZZ**) results in faster fluorescence quenching. Enantiodifferentiating photoisomerization of 1ZZ included and sensitized by γ cyclodextrin-based sensitizer is highly entropy-correlated.



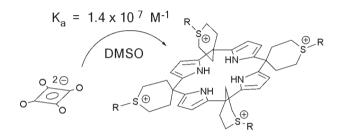


703

Sulfonium calix pyrrole: the decoration of a calix [4] pyrrole host with positive charges boosts affinity and selectivity of anion binding in DMSO solvent

Martin Valik, Vladimir Král, Eberhardt Herdtweck and Franz P. Schmidtchen*

Supplementation of the calix[4]pyrrole core structure by sulfonium centers enhances the affinity and selectivity of specific anion binding over background ion-pairing in DMSO dramatically.

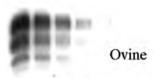


711

Enhanced detection of the pathogenic prion protein by its supramolecular association with para-sulfonato-calix[n]arene derivatives

Anthony W. Coleman,* Florent Perret, Sébastien Cecillon, Aly Moussa, Ambroise Martin, Maryline Dupin and Hervé Perron

para-Sulfonato-calix[n]arenes act to amplify the Western Blot immunological detection of the prion protein by the SAF84 antibody.



1/2 1/4 1/8 1/16 1/32

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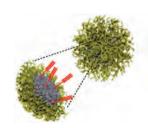
In presence of calixarene

718

Preparation of orthogonally-functionalized core Click cross-linked nanoparticles

Rachel K. O'Reilly, Maisie J. Joralemon, Craig J. Hawker* and Karen L. Wooley*

The single step cross-linking and Click readiedfunctionalization of alkynyl core functionalized micelles utilizing azido functionalized dendrimers (generations 0th–3rd) is described and allows for the synthesis of core Click cross-linked polymer nanoparticles with additional azido functionality available within the core domain and remaining carboxylic acid groups in the shell.





Core Click cross-linked polymer nanoparticle



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Inclusion of anthraquinone derivatives by the cucurbit[7]uril host

Vladimir Sindelar, Samantha E. Parker and Angel E. Kaifer*

The host cucurbit[7]uril forms inclusion complexes of moderate stability with cationic anthraquinone derivatives. The cathodic electrochemical behavior of the guests is strongly affected by complexation.

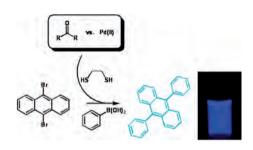


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Luminescent assays for ketones and aldehydes employing catalytic signal amplification

Ronald J. T. Houk and Eric V. Anslyn*

Novel catalytically amplified fluorescent and chemiluminescent sensors are reported in an assay for ketones and aldehydes.

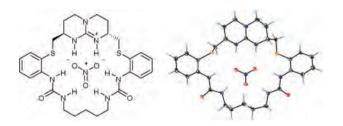


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Enthalpy driven nitrate complexation by guanidinium-based macrocycles

Pascal Blondeau, Jordi Benet-Buchholz and Javier de Mendoza*

All six lone pairs of a nitrate are fully complemented by oriented hydrogen bond donors from a macrocycle with one guanidinium and two urea subunits.

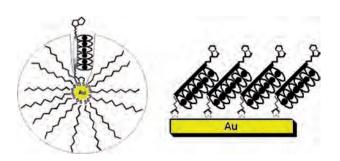


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Synthesis and characterization of peptide nanostructures chemisorbed on gold

Joëlle Martin Boutin, Julie Richer, Mélanie Tremblay, Véronique Bissonette and Normand Voyer*

Artificial ionic channels bearing a biotin end group were chemisorbed on gold substrates.



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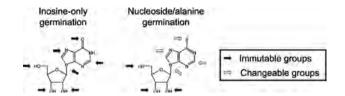
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748

Differential nucleoside recognition during *Bacillus cereus* 569 (ATCC 10876) spore germination

Ernesto Abel-Santos* and Tetyana Dodatko

Inosine is the only nucleoside able to germinate *B. cereus* 569 spores on its own. Addition of alanine as a co-germinant allows other nucleosides to replace inosine in the induction of spore germination.

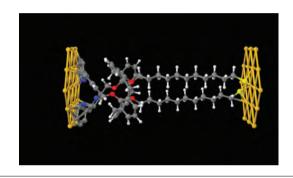


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Electron transport properties of calix[4]arene based systems in a metal-molecule-metal junction

Giuseppe Arena,* Ioannis Deretzis, Giuseppe Forte, Filippo Giannazzo, Antonino La Magna, Giuseppe Lombardo, Vito Raineri, Carmelo Sgarlata and Giuseppe Spoto*

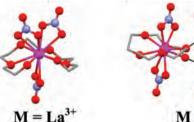
Metal–molecule–metal junctions based on a 1,3-alternate bis(dipyridyl)calix[4]arene derivative and its Cu^{2+} complex show different electron transport properties.

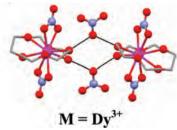


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Lanthanide polyether complexation chemistry: the interaction of hydrated lanthanide(III) nitrate salts with an acyclic 18-crown-6 analog, pentaethylene glycol

C. Corey Hines, Cary B. Bauer and Robin D. Rogers* Systematic structural investigations of lanthanide nitrate complexation with a pentaethylene glycol indicated structural transition points were a result of steric strain, ionic radii, and glycol conformation.





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