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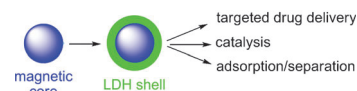


Nanocomposites

M. Shao, M. Wei,* D. G. Evans, X. Duan

Hierarchical Structures Based on Functionalized Magnetic Cores and Layered Double-Hydroxide Shells: Concept, Controlled Synthesis, and Applications

The core of the matter: The fabrication and application of magnetic-core/layered-double-hydroxide (LDH)-shell composites with hierarchical structure represent a new direction in the development of LDH-based multifunctional materials, which will contribute to the progress of chemistry and material science (see scheme).



Chem. Eur. J.
DOI: 10.1002/chem.201204205

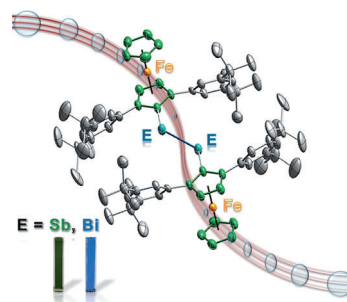


Main-Group Chemistry

M. Sakagami, T. Sasamori,* H. Sakai, Y. Furukawa, N. Tokitoh*

1,2-Bis(ferrocenyl)-Substituted Distibene and Dibismuthene: Sb=Sb and Bi=Bi Units as π Spacers between Two Ferrocenyl Units

Pi in the sky: 1,2-bis(ferrocenyl)distibene and 1,2-bis(ferrocenyl)dibismuthene derivatives, where two bulky ferrocenyl units are bridged by a Sb=Sb and Bi=Bi π spacer, have been synthesized as a new family of novel d- π conjugated systems. Their molecular structures, spectroscopic behavior, and electrochemical properties reveal the Sb=Sb and Bi=Bi units to be effective π -electron spacers.



Chem. Asian J.
DOI: 10.1002/asia.201201227

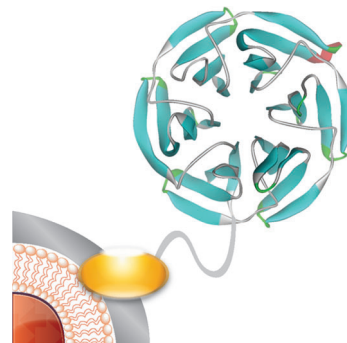


Genetic Engineering

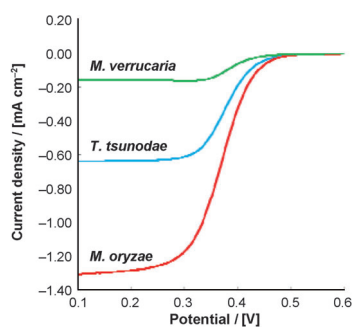
K. Zhang, H. Li, K. Bhuripanyo, B. Zhao, T. F. Chen, N. Zheng, J. Yin*

Engineering New Protein-Protein Interactions on the β -Propeller Fold by Yeast Cell Surface Display

Reinventing the wheel: The β -propeller domain folds like a wheel to provide key protein-protein interactions in the cell. Here we used high-throughput yeast sorting to “invent” β -propellers of new binding specificities with cellular targets.



ChemBioChem
DOI: 10.1002/cbic.201200718

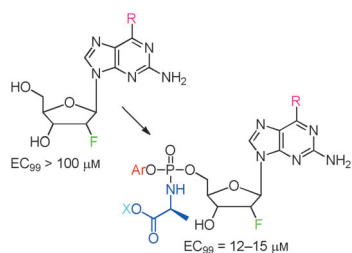
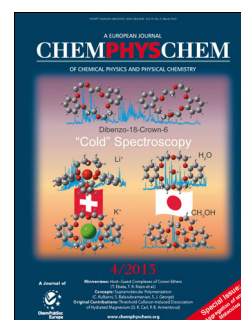


ChemPhysChem

DOI: 10.1002/cphc.201300027

Electrode Materials

M. Cadet, X. Brilland, S. Gounel, F. Louerat, N. Mano*

Design of a Highly Efficient O₂ Cathode Based on Bilirubin Oxidase from *Magnaporthe oryzae*
Fungi for the better: The so far highest known current density (1.37 mA cm⁻²) for the enzymatic O₂ reduction under physiological conditions is reported. This is achieved by the design of a new redox polymer with an increased catalytic site density and by using a new bilirubin oxidase (BOD) from *Magnaporthe oryzae*.


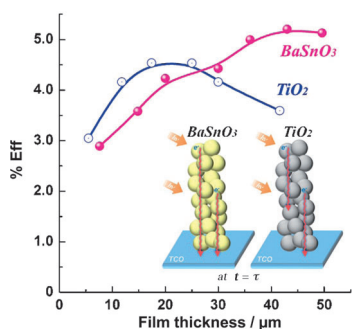
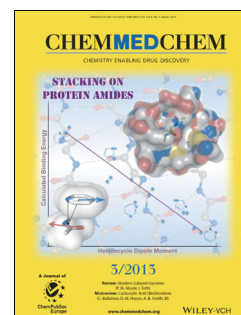
ChemMedChem

DOI: 10.1002/cmdc.201200562

Antiviral Agents

S. Meneghesso,* E. Vanderlinden, A. Brancale, J. Balzarini, L. Naesens, C. McGuigan

Synthesis and Biological Evaluation of Purine 2'-Fluoro-2'-deoxyribose ProTides as Anti-influenza Virus Agents

Tidal power: We report the synthesis and biological evaluation of several ProTides of 6-modified analogues of 2'-fluoro-2'-deoxyguanosine as anti-influenza agents. The superiority of the ProTides over the parent nucleosides was demonstrated in both influenza virus replication assays in MDCK cells and vRNP reconstitution assays in HEK-293T cells.


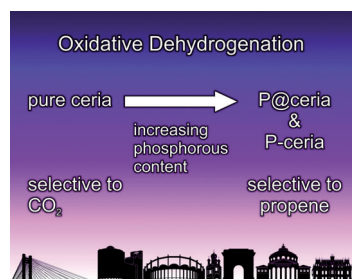
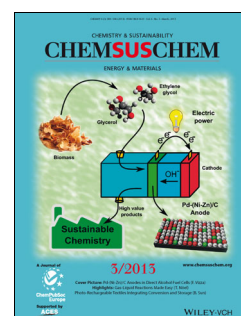
ChemSusChem

DOI: 10.1002/cssc.201200769

Solar Cells

D. W. Kim, S. S. Shin, S. Lee, I. S. Cho, D. H. Kim, C. W. Lee, H. S. Jung,* K. S. Hong*

BaSnO₃ Perovskite Nanoparticles for High Efficiency Dye-Sensitized Solar Cells

Electron collection: A high-potential material, BaSnO₃, as the photoanode of a dye-sensitized solar cell (DSSC) is explored. The DSSC that is fabricated using high crystalline BaSnO₃ nanoparticles shows an overall energy conversion efficiency of 5.2%, which is the highest performance in ternary oxide-based DSSCs. This high performance comes from rapid charge capture in the BaSnO₃ nanoparticle photoelectrode.


Bucharest

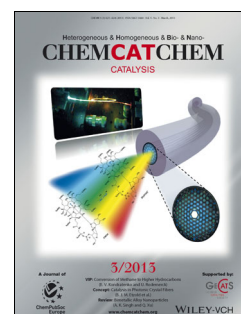
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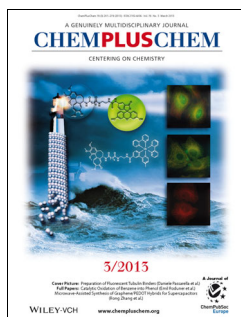
DOI: 10.1002/cctc.201200699

Oxidative Dehydrogenation

I.-T. Trotaș, C. M. Teodorescu, V. I. Pârvulescu, I.-C. Marcu*

Enhancing Oxidative Dehydrogenation Selectivity of Ceria-Based Catalysts with Phosphorus as Additive

Rise to the top: A series of phosphated ceria catalysts were studied and presented an increase in oxidative dehydrogenation selectivity with respect to pure ceria, mainly at the expense of total oxidation selectivity. Thus, the selectivity to propene was approximately 74% with surface-phosphated catalysts and 62% with bulk-phosphated catalysts.


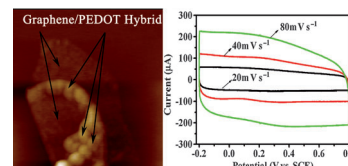


Graphene Hybrids for Supercapacitors

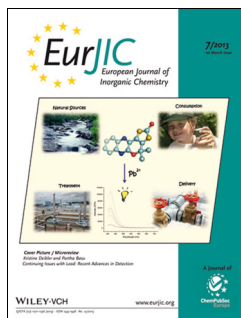
D. Sun, L. Jin, Y. Chen, J.-R. Zhang,* J.-J. Zhu*

Microwave-Assisted In Situ Synthesis of Graphene/PEDOT Hybrid and Its Application in Supercapacitors

Do it in the microwave: A graphene/poly(3,4-ethylenedioxythiophene) (G/PEDOT) hybrid has been prepared by the in situ polymerization of EDOT monomer using the precursor of graphene, graphene oxide, as an oxidant under microwave heating. The G/PEDOT hybrid as a supercapacitor material exhibits high specific capacitance (see figure), excellent electrochemical stability, and high energy density.



ChemPlusChem
DOI: 10.1002/cplu.201200206

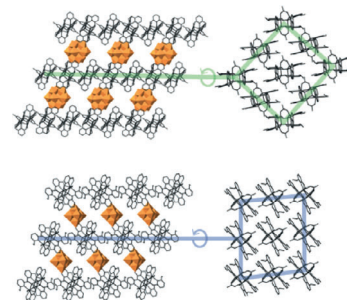


Single-Molecule Magnets

S. Cardona-Serra, J. M. Clemente-Juan, E. Coronado,*
C. Martí-Gastaldo, E. Navarro-Moratalla

The Use of Polyoxometalates in the Design of Layer-Like Hybrid Salts Containing Cationic Mn₄ Single-Molecule Magnets

Polyoxometalates (POMs) permit the controlled organization of single-molecule-magnet (SMM) units within the layered architecture of hybrid ionic crystals. By taking Mn₄ (complex cluster) as a case study, the use of POMs with different sizes and charges yields differently packed structures. The slow relaxation properties of the SMM component are strongly affected by the counteranion employed.



Eur. J. Inorg. Chem.
DOI: 10.1002/ejic.201201390

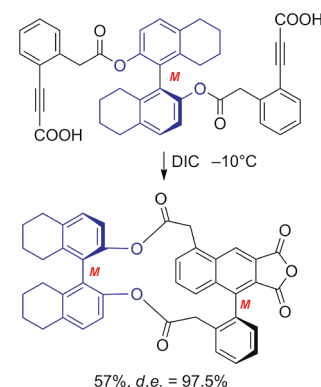


Atropisomerism

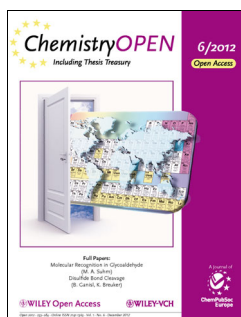
P. Wessig,* A. Matthes, U. Schilde, A. Kelling

Asymmetric Synthesis of (1,5)Naphthalenophanes by Dehydro-Diels–Alder Reaction

The asymmetric dehydro-Diels–Alder (ADDA) reaction to axially chiral (1,5)naphthalenophanes was investigated. Using chiral auxiliaries, both photochemical and thermal DDA provided the target compounds, in which the latter approach provided better results in regard to yields and stereoselectivity. Furthermore, the mechanism of the DDA reaction was investigated by means of DFT calculations.



Eur. J. Org. Chem.
DOI: 10.1002/ejoc.201201594

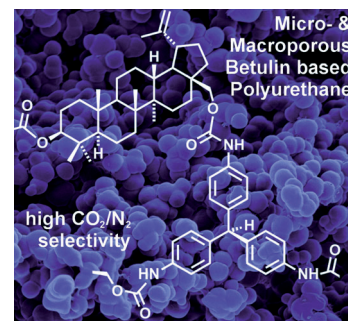


Gas Adsorption

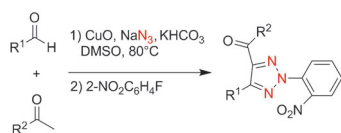
J. Jeromenok, W. Böhlmann, C. Jäger, J. Weber*

Carbon Dioxide Adsorption in Betulin-Based Micro- and Macroporous Polyurethanes

Separation of CO₂. Microporous polyurethane networks were prepared based on a renewable resource. Betulin, extracted from birch bark, is used as a structure-directing diol monomer in A₃-B₂ monomers. The resulting microporous networks show very promising CO₂/N₂ selectivities. The state of adsorbed CO₂ is analyzed by in situ NMR spectroscopy, and pure physisorption is proven. The preparation of monolithic materials is demonstrated as well.



ChemistryOpen
DOI: 10.1002/open.201200045



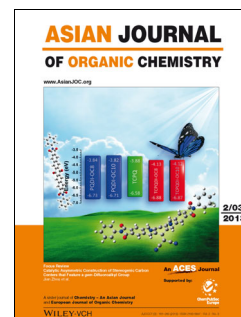
Asian J. Org. Chem.
DOI: 10.1002/ajoc.201300009

Multicomponent Reactions

X. Liu, X. Li, Y. Chen, D. Wang, J. Chen, B. Chen*

One-pot Four-component Synthesis of N2-Substituted 1,2,3-Triazoles

Tri and tri again: An efficient way of synthesizing 2,4,5-trisubstituted 1,2,3-triazoles by a cascade reaction with benzaldehydes, acetophenones, sodium azide, and aryl halides in one pot has been developed. This method is convenient, general, atom economical, and gives good yields with high regioselectivity.



ChemViews magazine
DOI: 10.1002/chemv.201300015

Chemical Feedstocks

Shale Gas: Impact on the Petrochemical Industry

Horizontal drilling and hydraulic fracking can produce natural gas from shale at competitive costs. The USA is the largest producer of shale gas in the world. As a consequence it has become one of the lowest-cost production locations for the petrochemical and chemical industry.

