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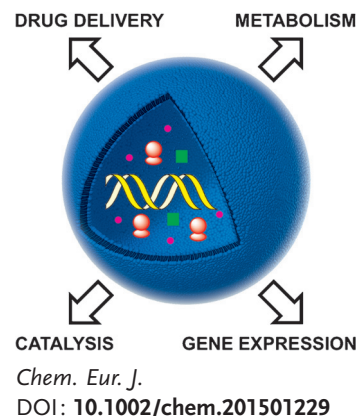


Functional Synthetic Membranes

R. J. Brea, M. D. Hardy, N. K. Devaraj*

Towards Self-Assembled Hybrid Artificial Cells: Novel Bottom-Up Approaches to Functional Synthetic Membranes

Hybrid artificial cells: Over the last years, considerable effort has been devoted to the integration of functionalized synthetic membranes with biological systems, producing “hybrid” artificial cells. This Concept article fundamentally covers recent advances and the current state-of-the-art of such hybrid systems. Specifically, the design of minimal supramolecular constructs that can faithfully mimic or reconstruct the structure and/or function of living systems is described.

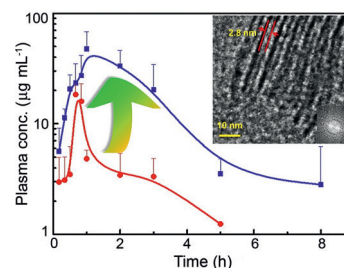


Drug Delivery

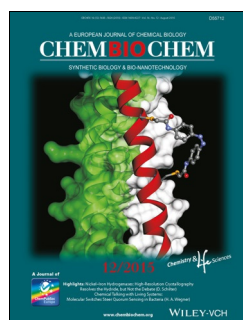
J.-Y. Kim, J.-H. Yang, J.-H. Lee, G. Choi, D.-H. Park, M.-R. Jo, S.-J. Choi, J.-H. Choy*

2D Inorganic–Antimalarial Drug–Polymer Hybrid with pH-Responsive Solubility

Arte et labore: An in-vivo pharmacokinetic study of artesunate showed a dramatic increase in drug absorption after oral administration with the zinc basic salt–artesunate–Eudragit L100 (ZBS-AS-L100) hybriide, and the AUC value for ZBS-AS-L100 (blue line) was 5.5 fold higher than that for intact AS (red line).



Chem. Asian J.
DOI: 10.1002/asia.201500347

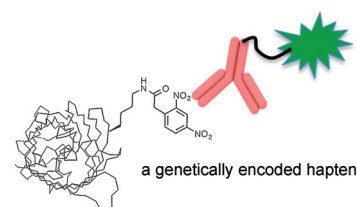


Vaccine Development

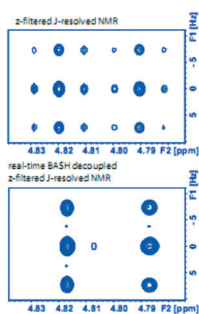
W. Ren, A. Ji, M. X. Wang, H.-w. Ai*

Expanding the Genetic Code for a Dinitrophenyl Hapten

Something unnatural about it: A dinitrophenyl (DNP)-containing unnatural amino acid was genetically encoded for the preparation of hapten-labeled proteins. This small hapten moiety was able to induce selective interactions with anti-DNP antibodies. The capability of genetically introducing DNP into proteins has potential for applications in biosensing and bioseparation, immunology, and therapeutics.

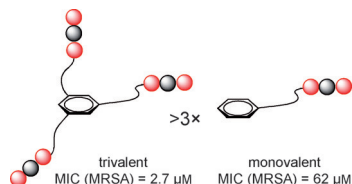


ChemBioChem
DOI: 10.1002/cbic.201500204



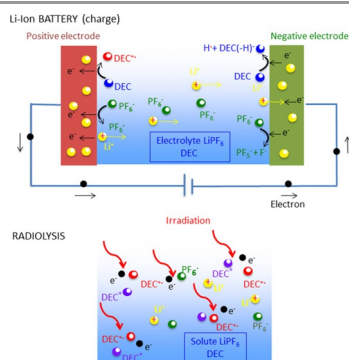
ChemPhysChem

DOI: 10.1002/cphc.201500377



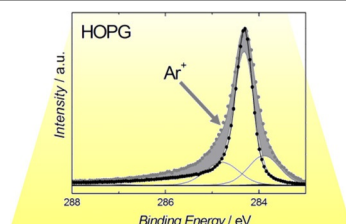
ChemMedChem

DOI: 10.1002/cmdc.201500220



ChemSusChem

DOI: 10.1002/cssc.201500641



ChemCatChem

DOI: 10.1002/cctc.201500344

Homonuclear Decoupling

A. Verma, B. Baishya*

Real-Time Band-Selective Homonuclear Proton Decoupling for Improving Sensitivity and Resolution in Phase-Sensitive J-Resolved Spectroscopy

BASHing the competition: The application of real-time band-selective homonuclear ^1H decoupling during data acquisition in J-resolved spectroscopy improves the sensitivity and resolution, and thus aids the measurement of J couplings and residual dipolar couplings. High quality spectra can be obtained for regions of interest in peptides, organic molecules, and also enantiomers.

Antibiotics

B. C. Hoffknecht, D. J. Worm, S. Bobersky, P. Prochnow, J. E. Bandow, N. Metzler-Nolte*

Influence of the Multivalency of Ultrashort Arg-Trp-Based Antimicrobial Peptides (AMP) on Their Antibacterial Activity

More than the sum of its parts: The antibacterial activities of 15 new antimicrobial peptides on five different bacterial strains were tested, including an MRSA strain. With ultrashort peptides a clear synergistic effect of the trivalent display was observed. The best candidates showed activities in the low-micromolar range against Gram-positive MRSA and Gram-negative *A. baumannii*, with only minimal hemolytic activity against red blood cells.

Lithium-Ion Batteries

D. Ortiz, I. Jiménez Gordon, J.-P. Baltaze, O. Hernandez-Alba, S. Legand, V. Dauvois, G. Si Larbi, U. Schmidhammer, J.-L. Marignier, J.-F. Martin, J. Belloni, M. Mostafavi, S. Le Caër*

Electrolytes Ageing in Lithium-ion Batteries: A Mechanistic Study from Picosecond to Long Timescales

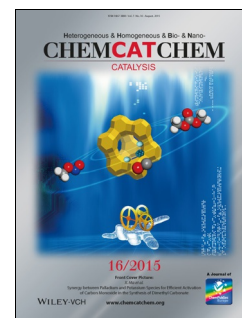
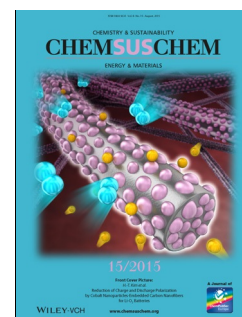
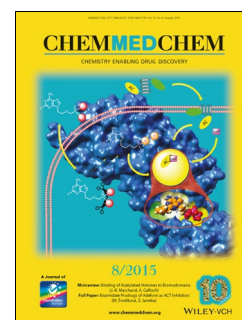
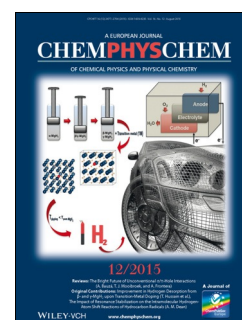
Accelerated Ageing! Radiolysis is used as a tool to study the ageing phenomena occurring in various diethyl carbonate/LiPF₆ solutions. The degradation products obtained by radiolysis are similar to the ones occurring in electrolysis of Li-ion batteries (LIBs) (see scheme). The research validates the use of steady-state and pulse radiolysis as tools to quickly investigate the reactivity of newly developed electrolytes.

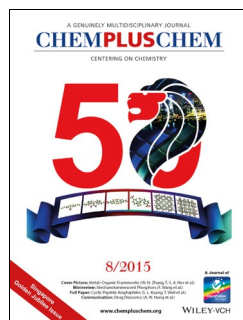
Catalyst Characterization

R. Blume,* D. Rosenthal, J.-P. Tessonnier, H. Li, A. Knop-Gericke, R. Schlögl

Characterizing Graphitic Carbon with X-ray Photoelectron Spectroscopy: A Step-by-Step Approach

Putting carbon defects in line: High-resolution XPS and XPS depth profiling are used to characterize binding energies and spectral line shapes of sp² carbon, surface-defect states, and disordered carbon in highly ordered carbon nanostructures. The distinct features of these components, for example, the strong asymmetric shape of the sp² carbon peak changing with surface curvature and defect density, cannot be neglected in spectral analysis and require careful evaluation for a high quality deconvolution. HOPG = Highly ordered pyrolytic graphite.



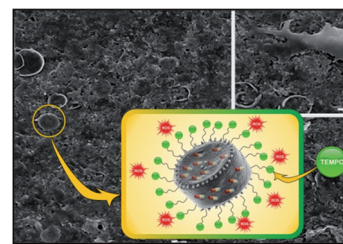


Biomaterials

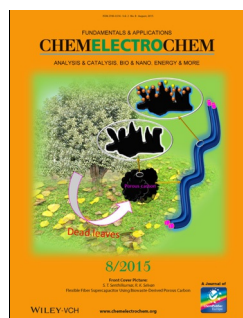
S. R. Cicco, D. Vona, E. De Giglio, S. Cometa, M. Mattioli-Belmonte, F. Palumbo, R. Ragni, G. M. Farinola*

Chemically Modified Diatoms Biosilica for Bone Cell Growth with Combined Drug-Delivery and Antioxidant Properties

Them bones gonna rise again: Covalent functionalization of nanostructured silica shells from diatoms with TEMPO radical endows biosilica with both drug-delivery properties and antioxidant activity. The resulting functional biosilica is demonstrated to be a suitable substrate for bone cell growth.



ChemPlusChem
DOI: 10.1002/cplu.201402398

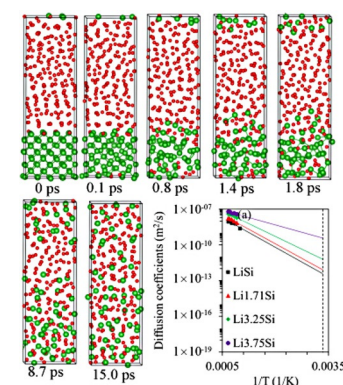


Silicon Lithiation

Z. Wang,* Q. Su, H. Deng, Y. Fu*

Composition Dependence of Lithium Diffusion in Lithium Silicide: A Density Functional Theory Study

Diffusion dependence: The lithiation process of silicon is investigated by using ab initio molecular dynamics. The results show that the Li mobility is strongly dependent on the composition of Li_xSi alloys. Li diffusivity in the Li_xSi alloy can be enhanced by two orders of magnitude when x is increased from 1.0 to 3.75, which can be attributed to the instability of the Si network, owing to the charge transfer from Li to Si.



ChemElectroChem
DOI: 10.1002/celec.201500201

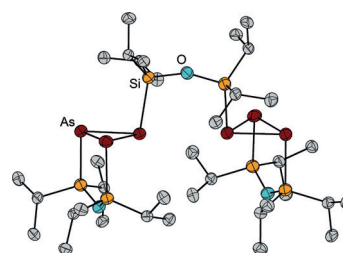


Phosphorus/Arsenic Homology

C. Clobes, P. Jerabek, I. Nußbruch, G. Frenking, C. von Hänisch*

Stepwise Synthesis of Siloxane-Substituted Oligoarsanes and Structural Investigation of Alkaline Earth Metal Derivatives

A set of different arsane compounds based on siloxanes were synthesized and compared with their phosphorus analogues. After oxidative coupling of the cyclic compounds $(\text{HESi}(\text{Pr})_2)_2\text{O}$, different product types were obtained for $\text{E} = \text{P}$ and $\text{E} = \text{As}$. The courses of the different reactions are investigated in experimental and quantum chemical terms to explain the different outcomes for P and As.



Eur. J. Inorg. Chem.
DOI: 10.1002/ejic.201500279

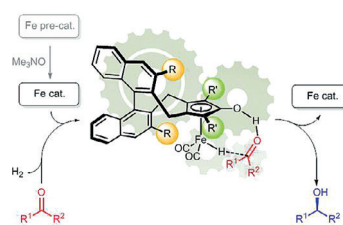


Iron Catalysis

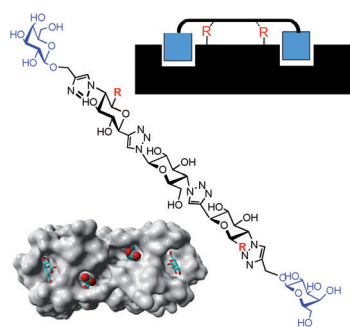
P. Gajewski, M. Renom-Carrasco, S. V. Facchini, L. Pignataro,* L. Lefort, J. G. de Vries, R. Ferraccioli, U. Piarulli,* C. Gennari*

Synthesis of (R)-BINOL-Derived (Cyclopentadienone)iron Complexes and Their Application in the Catalytic Asymmetric Hydrogenation of Ketones

A family of chiral (cyclopentadienone)iron complexes with an (R)-BINOL-derived backbone is described. The complexes differ in the substituents at the 3,3'-positions of the binaphthyl residue (H, OH, OR, OCOR, or OSO_2R) or at the 2,5-positions of the cyclopentadienone ring (trimethylsilyl, or Ph) and provide up to 77% ee in the asymmetric hydrogenation of ketones.



Eur. J. Org. Chem.
DOI: 10.1002/ejoc.201500796



ChemistryOpen
DOI: 10.1002/open.201402171

Carbohydrate Synthesis

O. Fu, A. V. Pukin, H. C. Quarles van Ufford, J. Kemmink, N. J. de Mol, R. J. Pieters*

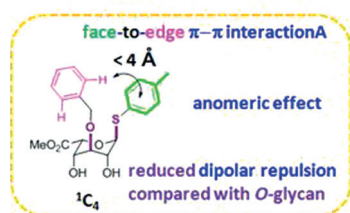
Functionalization of a Rigid Divalent Ligand for LecA, a Bacterial Adhesion Lectin

Linkers for lectin ligands! The *P. aeruginosa* lectin and virulence factor LecA can be efficiently blocked by divalent galactoside ligands containing a rigid spacer. Further functionalization of the spacer was explored in order to foster spacer–protein interactions. Positively and negatively charged groups as well as lipophilic groups were used for this purpose.



Mechanism:
small forces make a big change

NMR-based conformation analysis on
intramolecular weak forces favoring IdoA



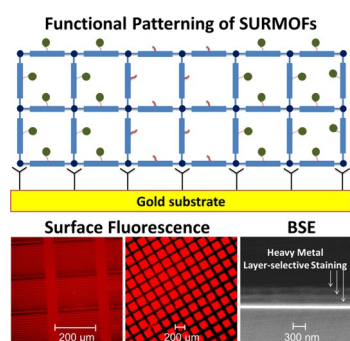
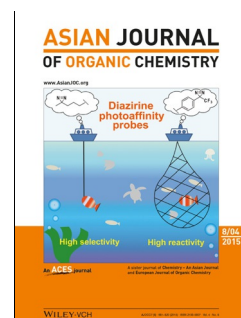
Asian J. Org. Chem.
DOI: 10.1002/ajoc.201500269

Carbohydrate chemistry

X. Cao, Q. Lv, D. Li, H. Ye, X. Yan, X. Yang, H. Gan, W. Zhao, L. Jin,* P. Wang,* J. Shen*

Direct C5-Isomerization Approach to L-Iduronic Acid Derivatives

Hepster: Inspired by the biosynthesis of heparan sulfate (HS), we present a direct epimerization approach to L-iduronic acid synthons (IdoA) from the corresponding C5 epimers, D-glucuronic acids (GlcA). Molecular mechanisms were extensively studied. Based on this approach, GlcA and IdoA synthons for the synthesis of fondaparinux were convergently prepared in 14 steps.



ChemNanoMat
DOI: 10.1002/cnma.201500031

Metal–Organic Frameworks

Z. Wang, J. Liu, S. Grosjean, D. Wagner, W. Guo, Z. Gu, L. Heinke, H. Gliemann, S. Bräse, C. Wöll*

Monolithic, Crystalline MOF Coating: An Excellent Patterning and Photoresist Material

Azido- and alkyne-based SURMOFs (surface-anchored metal–organic frameworks) thin films were prepared using a liquid-phase epitaxial (LPE) process with automated systems. The functional groups (e.g., fluorescent dye molecules) were selectively located into the MOF thin films based on a photo-controlled post-synthetic modification (PSM).



ChemViews magazine
DOI: 10.1002/chemv.201500057

Career

K. Schmitz, V. Koester

Applying for a Job at Merck

What do international chemical companies expect from applicants? Peer Elger Schotmann, Recruiter at Merck KGaA, gives helpful and detailed tips on résumés, cover letters, avoiding common mistakes, and how to present yourself in the best way possible.

