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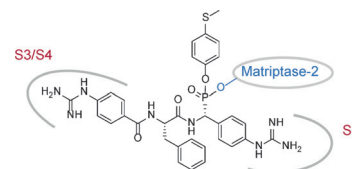


Enzyme Inhibition

D. Häußler, M. Mangold, N. Furtmann, A. Braune, M. Blaut, J. Bajorath, M. Stirnberg, M. Gütschow*

Phosphono Bisbenzguanidines as Irreversible Dipeptidomimetic Inhibitors and Activity-Based Probes of Matriptase-2

A triple hold on matriptase-2: Inhibition of matriptase-2 is considered as an attractive strategy for the treatment of iron-overload diseases. Nine peptidomimetic inactivators were synthesized with a phosphonate warhead and two benzguanidine moieties as arginine mimetics (see scheme). Five of these were characterized as irreversible inhibitors of matriptase-2. Insertion of a coumarin label generated the first activity-based fluorescent probe for matriptase-2.



Chem. Eur. J.
DOI: 10.1002/chem.201600206

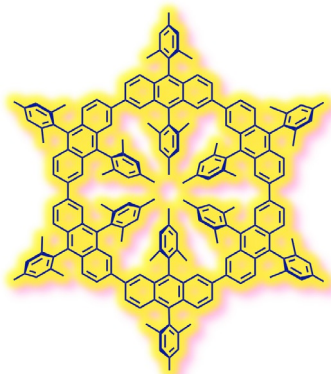


Reaction Mechanisms

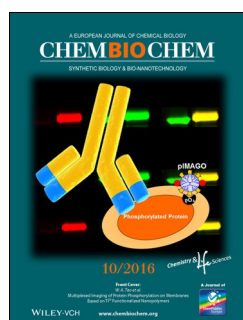
Y. Yamamoto, K. Wakamatsu, T. Iwanaga, H. Sato, S. Toyota*

Macrocyclic 2,7-Anthrylene Oligomers

A fluctuating hexagon: A macrocyclic aromatic framework was constructed with six 2,7-anthrylene units by a coupling reaction with the aid of twelve mesityl groups that increase the solubility. The molecule has a hexagonal and nonplanar wheel-shaped framework, and undergoes successive rotations of about six single-bond axes in solution.



Chem. Asian J.
DOI: 10.1002/asia.201600230

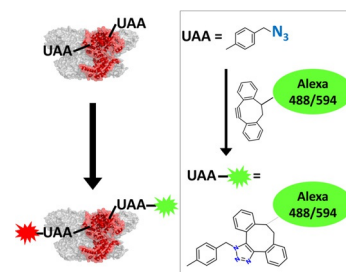


Single-Molecule Imaging

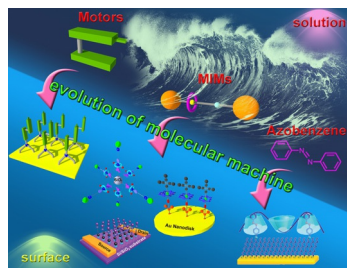
T. C. Lee, M. Kang, C. H. Kim, P. G. Schultz, E. Chapman,*
A. A. Deniz*

Dual Unnatural Amino Acid Incorporation and Click-Chemistry Labeling to Enable Single-Molecule FRET Studies of p97 Folding

Watching one p97 at a time: The single-molecule biophysical chemistry of p97, a complex, cysteine-rich, essential cellular protein machine, can now be studied using smFRET, thanks to the use of advanced site-specific dye labeling by an unnatural amino acid and click chemistry.

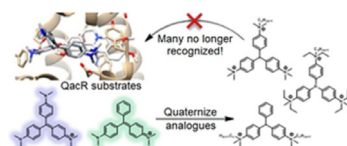


ChemBioChem
DOI: 10.1002/cbic.201500695



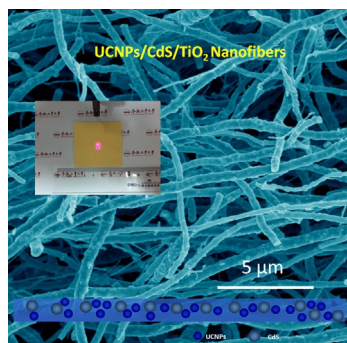
ChemPhysChem

DOI: 10.1002/cphc.201501048



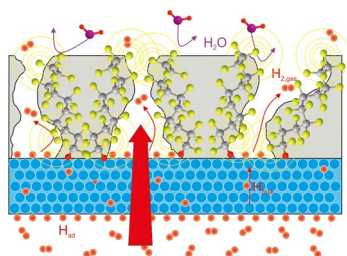
ChemMedChem

DOI: 10.1002/cmdc.201600095



ChemSusChem

DOI: 10.1002/cssc.201600334



ChemCatChem

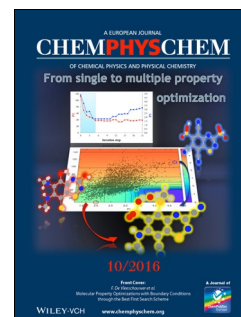
DOI: 10.1002/cctc.201600168

Molecular Machines

Q. Zhang, D.-H. Qu*

Artificial Molecular Machine Immobilized Surfaces: A New Platform To Construct Functional Materials

A little AMMIS: Artificial molecular machines have received significant attention from chemists. However, their practical application is still challenging, because the working platform of artificial molecular machines is mostly in solution. Herein, some recent advances of functional artificial molecular machine immobilized surfaces (AMMISs) are reviewed. The functions of AMMISs are highlighted and strategies for their construction are also discussed.

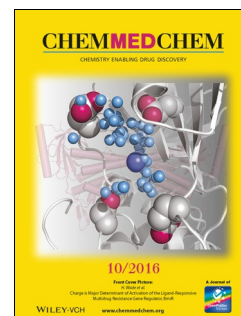


Antibacterial Agents

M. E. Forman, M. H. Fletcher, M. C. Jennings, S. M. Duggan, K. P. C. Minbiole,* W. M. Wuest*

Structure–Resistance Relationships: Interrogating Antiseptic Resistance in Bacteria with Multicationic Quaternary Ammonium Dyes

The SRRs of QACs! We report the synthesis and antimicrobial activity of a series of mono- and multi-quaternary ammonium compounds (QACs) based on commercially available dye scaffolds to probe their “structure–resistance relationship”. MonoQACs demonstrated increased MIC values against Gram-positive strains known to contain resistance genes, including those previously shown to efflux QACs. In contrast, our multiQACs retained activity against such bacteria as well as Gram-negative strains.

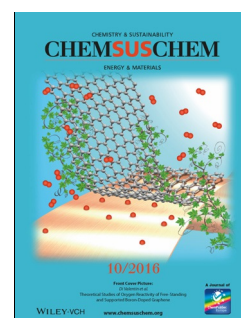


Photocatalysis

F. Zhang, C.-L. Zhang, W.-N. Wang, H.-P. Cong, H.-S. Qian*

Titanium Dioxide/Upconversion Nanoparticles/Cadmium Sulfide Nanofibers Enable Enhanced Full-Spectrum Absorption for Superior Solar Light Driven Photocatalysis

Moving on up: TiO₂ nanofibers are incorporated within high populations of upconversion nanoparticles (UCNPs) and CdS nanospheres; this results in Förster resonance energy-transfer configurations of the components that are in close proximity. The as-prepared TiO₂/UCNPs/CdS nanofibers exhibit unique optical properties with wide absorption in the $\lambda = 280\text{--}800\text{ nm}$ range, which results in enhanced photocatalytic abilities.

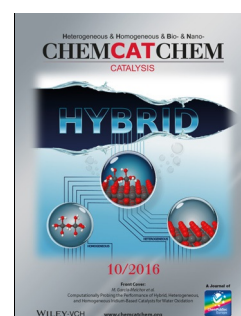


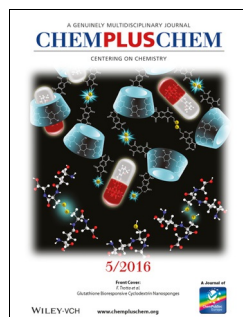
Membranes

R. Delmelle,* P. Ngene, B. Dam, D. Bleiner, A. Borgschulte

Promotion of Hydrogen Desorption from Palladium Surfaces by Fluoropolymer Coating

Access granted: The permeation kinetics of H₂ through a Pd membrane is significantly enhanced by the presence of a polytetrafluoroethylene (PTFE) coating deposited on the permeate side. The H₂ flux is increased both in ultrahigh vacuum (UHV) and in air. This is attributed to a combination of the hydrophobicity of PTFE and a promoter effect that enhances the desorption kinetics by the electrostatic field generated by the F atoms present in the coating.



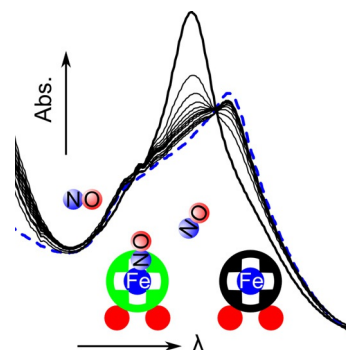


Sensors

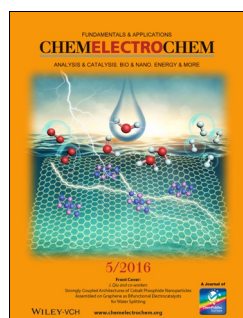
S. Fischer, J. Vestfrid, A. Mahammed, F. Herrmann-Westendorf, M. Schulz, J. Müller, O. Kiesewetter, B. Dietzek, Z. Gross,* M. Presselt*

Photometric Detection of Nitric Oxide Using a Dissolved Iron(III) Corrole as a Sensitizer

NO hiding from this sensor: Reversible binding of nitric oxide to an iron(III) corrole induces spectral changes close to the Soret absorption band, thus enabling photometric nitric oxide detection (see figure). Sensitive photometric detection in the picomolar range was possible using this amphiphilic iron(III) corrole. The amphiphilicity allows for self-assembly of the complex into thin solid films, which will be developed for sensing applications.



ChemPlusChem
DOI: 10.1002/cplu.201500553

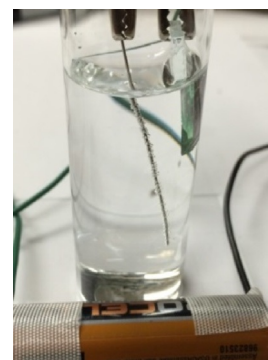


Electrodeposition

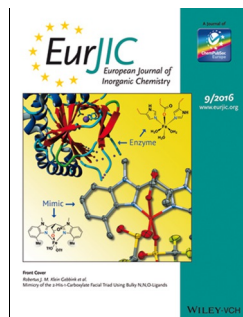
H. Yuan, R. R. Lunt, G. J. Blanchard, R. Y. Ofoli*

Synthesis of MnO_x Water Oxidation Catalyst on Fluorine-Doped Tin Oxide with a Dual-Series Cyclic Voltammetry Method

A glass of bubbly: Visual evidence is reported for water oxidation induced by a manganese-oxide catalyst, which is synthesized by using a novel dual-series electrodeposition procedure on fluorine-doped tin oxide. The system is powered by a single AA battery (1.5 V). The visible bubbles of H_2 are the result of the reconstitution of hydrogen ions on the platinum wire.



ChemElectroChem
DOI: 10.1002/celc.201500518

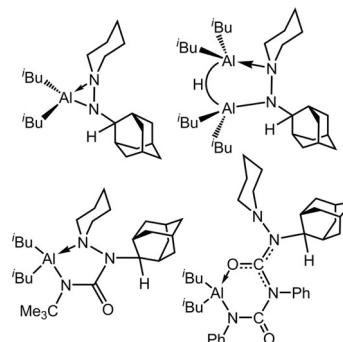


Aluminium Hydrazides

W. Uhl,* J. S. Bruchhage, M. Willeke, A. Hepp, J. Kösters

Reactivity of a Monomeric Aluminium Hydrazide towards Isocyanates and Isothiocyanates: Active Lewis Pair Behaviour versus Classical Insertion Reactions

A monomeric aluminium hydrazide with a strained AlN_2 heterocycle was obtained by hydroalumination of a hydrazone. It shows interesting chemical behaviour and reacted as an active Lewis pair with the coordination of $i\text{Bu}_2\text{AlH}$ or by insertion of one or two molecules of isocyanate into the Al–N polar covalent bond to afford a fascinating variety of structural motifs.



Eur. J. Inorg. Chem.
DOI: 10.1002/ejic.201600170

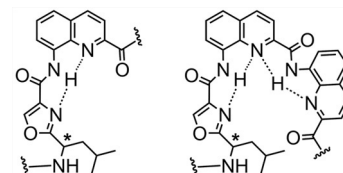


Hybrid Foldamers

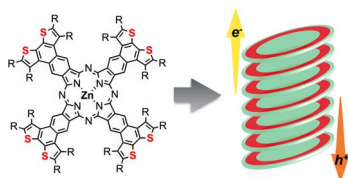
M. Kudo, D. Carbajo López, V. Maurizot, H. Masu, A. Tanatani,* I. Huc*

Synthesis and Conformational Analysis of Quinoline–Oxazole Peptides

When combined in the same sequence, oxazole amino acids and quinoline amino acids may simultaneously express their distinct conformational preferences. But if quinoline units are more numerous, they impose their preferences onto the oxazole units.



Eur. J. Org. Chem.
DOI: 10.1002/ejoc.201600229



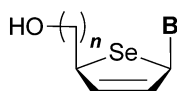
Liquid Crystals

H. Suzuki, K. Kawano, K. Ohta, Y. Shimizu, N. Kobayashi,
M. Kimura*

Topological Control of Columnar Stacking Made of Liquid-Crystalline Thiophene-Fused Metallonaphthalocyanines

Liquid crystal stacks: Carrier mobility is enhanced by enlargement of π -conjugated core and control of self-organized nanostructures. Here, we designed two regioisomers of thiophene-fused zinc naphthalocyanines to obtain photo- and electroactive liquid crystalline materials. Both compounds exhibited liquid crystalline behavior over a wide temperature range through intermolecular π - π interactions and local phase segregation between the aromatic cores and peripheral side chains.

ChemistryOpen
DOI: 10.1002/open.201500205



- 3a ($n = 2$, **B** = uracil)
3b ($n = 2$, **B** = thymine)
3c ($n = 2$, **B** = cytosine)
3d ($n = 1$, **B** = adenine)
3e ($n = 2$, **B** = adenine)

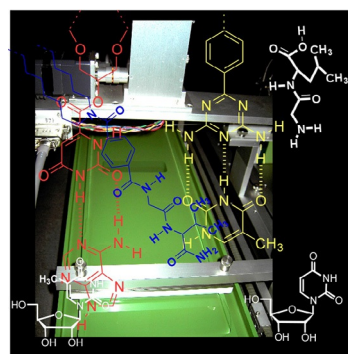
Asian J. Org. Chem.
DOI: 10.1002/ajoc.201600154

4'-Selenonucleosides

S. Qu, G. Kim, J. Yu, P. K. Sahu, Y. Choi, S. D. Naik, L. S. Jeong*

Synthesis and Anti-HIV Activity of 5'-Homo-2',3'-dideoxy-2',3'-didehydro-4'-selenonucleosides (5'-Homo-4'-Se-d4Ns)

Se you there: Stereoselective synthesis of 5'-homo-2',3'-dideoxy-2',3'-didehydro-4'-selenopyrimidine and purine nucleosides (4'-Se-d4Ns) **3a–e** as anti-HIV agents was accomplished from D-gulonic γ -lactone.



ChemNanoMat
DOI: 10.1002/cnma.201600053

Molecular Recognition

K. Ariga*

Interfaces Working for Biology: Solving Biological Mysteries and Opening Up Future Nanoarchitectonics

Point of contact: Understanding behavior at interfaces is key to understanding molecular recognition in aqueous media. This information allows possible scenarios to be proposed for the origin of cell membranes, the fabrication of nanostructures for tuning interactions with biomolecules, the control of cell differentiation, and the development of biomimetic computing devices.



ChemViews magazine
DOI: 10.1002/chemv.201600040

Biotechnology

C. Ley, J. B. Nielsen

From Research to Industry

Professor Jens B. Nielsen, Sweden, has founded several companies and holds over 50 patents. In this interview, he explains the challenges startups face with a focus on biotechnology. He also gives advice on how to transfer research results into a successful company.

