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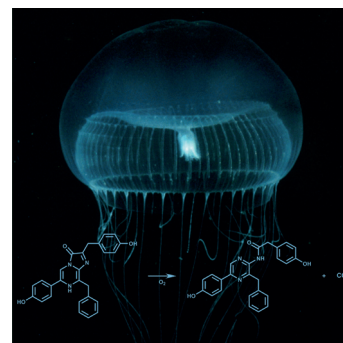


Bioluminescence

E. P. Coutant, Y. L. Janin*

Synthetic Routes to Coelenterazine and Other Imidazo[1,2-*a*]pyrazin-3-one Luciferins: Essential Tools for Bioluminescence-Based Investigations

Better the devil you know: Imidazo[1,2-*a*]pyrazine luciferins are an important tool in bioluminescence-based investigations. This review describes the synthetic pathways that are used in their preparation, along with the research efforts aimed at preparing analogues better suited to the design of bioluminescence-based assays.



Chem. Eur. J.
DOI: 10.1002/chem.201501531

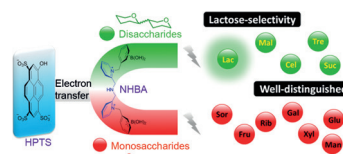


Sensors

X.-t. Zhang, S. Wang, G.-w. Xing*

Novel Boronlectins Based on Bispyridium Salt with a Flexible Linker: Discriminative Sensing of Lactose and Other Monosaccharides and Disaccharides in Aqueous Solution

Sensing lactose! The discrimination of five disaccharides and six monosaccharides was achieved by the integrated sensor array through linear discriminant analysis (LDA).



Chem. Asian J.
DOI: 10.1002/asia.201500743

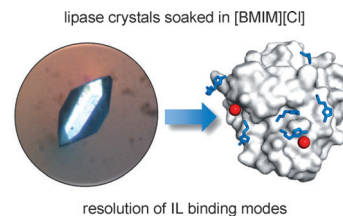


Biocatalysis

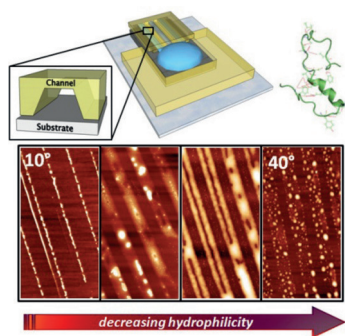
E. M. Nordwald, J. G. Plaks, J. R. Snell, M. C. Sousa, J. L. Kaar*

Crystallographic Investigation of Imidazolium Ionic Liquid Effects on Enzyme Structure

Ionic interactions: The nature of the interaction of ionic liquids with enzymes was investigated by determining the crystal structure of *B. subtilis* lipase A and an ionic liquid-stable variant in the presence of increasing concentrations of 1-butyl-3-methylimidazolium chloride. Analysis of the binding mode offered insight into the molecular basis for stabilizing enzymes from ionic liquid-induced denaturation.

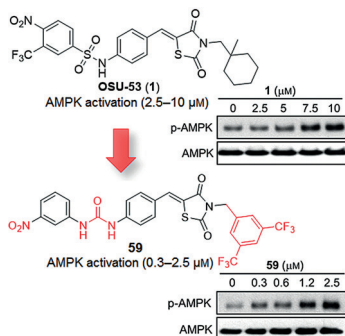


ChemBioChem
DOI: 10.1002/cbic.201500398



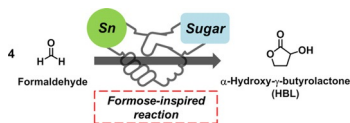
ChemPhysChem

DOI: 10.1002/cphc.201500602



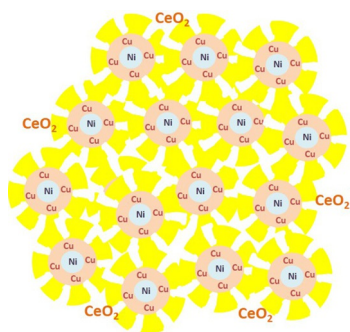
ChemMedChem

DOI: 10.1002/cmdc.201500371



ChemSusChem

DOI: 10.1002/cssc.201500885



ChemCatChem

DOI: 10.1002/cctc.201500481

Peptide Aggregation

G. Foschi, C. Albonetti,* F. Liscio, S. Milita, P. Greco, F. Biscarini

Amorphous Aggregation of Amyloid Beta 1-40 Peptide in Confined Space

The **amorphous aggregation** of Aβ1-40 peptide is addressed by using micromolding in capillaries. Both the morphology and the size of the aggregates are modulated by changing the contact angle of the sub-micrometric channel walls. Upon decreasing the hydrophilicity of the channels, the aggregates change their morphology from small aligned drops to discontinuous lines, thereby keeping their amorphous structure. Aβ1-40 fibrils are observed at high contact angles.

Drug Design and Optimization

E. M. E. Dokla, C.-S. Fang, P.-T. Lai, S. K. Kulp, R. A. T. Serya, N. S. M. Ismail, K. A. M. Abouzid,* C.-S. Chen*

Development of Potent Adenosine Monophosphate Activated Protein Kinase (AMPK) Activators

Small-molecule AMPK activators: Metabolism reprogramming is a key feature of all cancer cells. Adenosine monophosphate activated protein kinase (AMPK) is an energy sensor; activation of this enzyme can restore normal cell metabolism. Starting with the previously reported AMPK activator OSU-53 (1), an optimization study was conducted, guided by docking studies. Compound 59 was identified as the optimal agent, with greater potency than OSU-53.

Renewables

S. Yamaguchi,* T. Matsuo, K. Motokura, Y. Sakamoto, A. Miyaji, T. Baba*

Mechanistic Insight into a Sugar-Accelerated Tin-Catalyzed Cascade Synthesis of α-Hydroxy-γ-butyrolactone from Formaldehyde

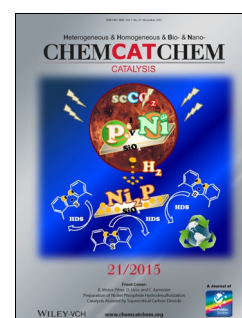
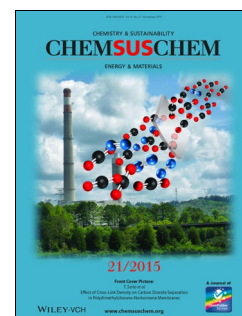
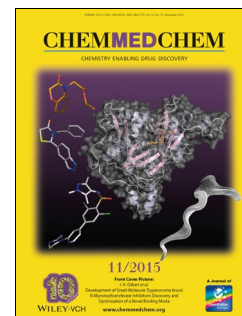
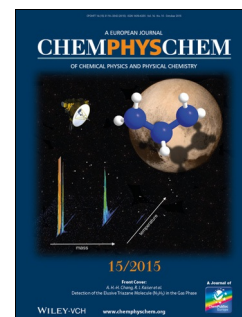
Glucose powered: The formose reaction, which involves the formation of sugars from formaldehyde, is usually confined to the selective synthesis of unprotected sugars. A homogeneous tin chloride can be used to produce α-hydroxy-γ-butyrolactone (HBL), which is one of the most important intermediates in pharmaceutical syntheses, from paraformaldehyde.

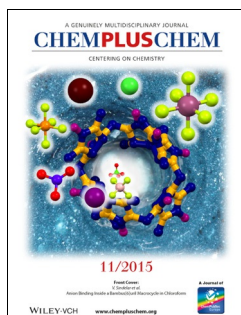
Water-Gas Shift

E. T. Saw, U. Oemar, M. L. Ang, K. Hidajat, S. Kawi*

Highly Active and Stable Bimetallic Nickel–Copper Core–Ceria Shell Catalyst for High-Temperature Water–Gas Shift Reaction

3 Synergistic effects in 1 catalyst: A 5 nm 10 wt% Ni-Cu@CeO₂ catalyst shows high performance at 500 °C in the high-temperature water–gas shift reaction, owing to its high level of metal–support interaction, small bimetallic Ni-Cu particles, and high degree of surface lattice O. Strongly adsorbed CO and type I OH could be the most important intermediate species in the water–gas shift reaction, as evidenced by using CO temperature-programmed reduction–MS and in situ diffuse-reflectance IR Fourier transform spectroscopy.



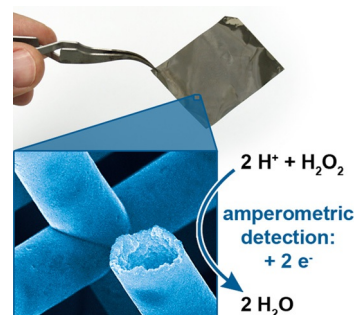


Nanotechnology

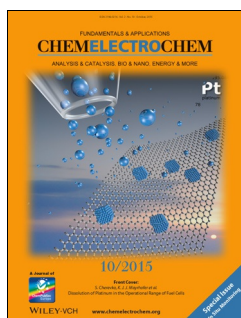
F. Muench,* D. M. De Carolis, E.-M. Felix, J. Brötz, U. Kunz, H.-J. Kleebe, S. Ayata, C. Trautmann, W. Ensinger

Self-Supporting Metal Nanotube Networks Obtained by Highly Conformal Electroless Plating

Ordered nano-superstructures: When polymer templates containing pore networks are subjected to specifically optimized electroless plating reactions, self-supporting arrays of cross-linked metal nanotubes are obtained (see figure). Due to their well-defined structure, high surface area, and porosity, these materials are promising unsupported catalysts; this is demonstrated in the amperometric detection of hydrogen peroxide.



ChemPlusChem
DOI: 10.1002/cplu.201500073

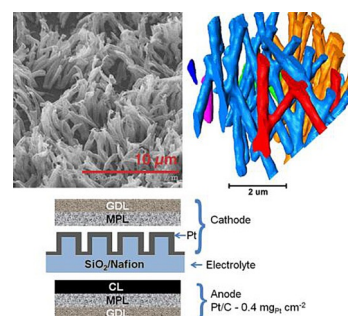


Electrode Materials

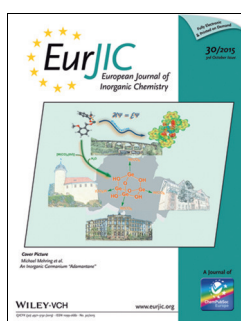
S. K. Babu, R. W. Atkinson, III, A. B. Papandrew, S. Litster*

Vertically Oriented Polymer Electrolyte Nanofiber Catalyst Support for Thin Film Proton-Exchange Membrane Fuel Cell Electrodes

Straight up improvements: High-surface-roughness polymer electrolyte nanofibers are synthesized by using solution-based template casting. The nanofibers are used as a catalyst support in an extended-surface proton exchange membrane fuel cell electrode. Morphological and electrochemical characterization of these electrodes is presented. These electrodes show promising results of increased electrochemically active surface area and performance.



ChemElectroChem
DOI: 10.1002/celec.201500232

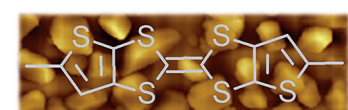


Molecular Conductors

R. A. L. Silva, I. C. Santos, E. B. Lopes, S. Rabaça, S. Galindo, M. Mas-Torrent, C. Rovira, M. Almeida, D. Belo*

A Methyl-Substituted Thiophene–Tetrathiafulvalene Donor and Its Salts

α -Methyldithiophene–tetrathiafulvalene has lower oxidation potentials than the unsubstituted analogue and shows a mobility of $4 \times 10^{-4} \text{ cm}^2 \text{ V}^{-1} \text{ s}^{-1}$ if used as a semiconductor in an organic field-effect transistor. Two charge-transfer salts are obtained by electrocrystallization; they present unusual stoichiometries and interesting crystal structures that are modulated by the donor's methyl group.



Eur. J. Inorg. Chem.
DOI: 10.1002/ejic.201500806

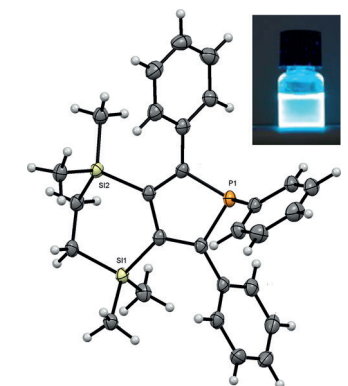


Antigen Mimetics

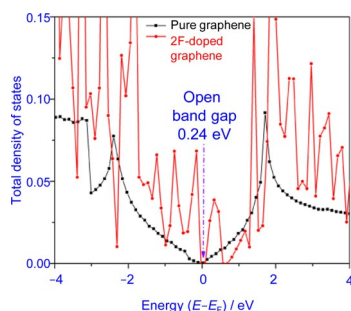
A. Ardá, R. Bosco, J. Sastre, F. J. Cañada, S. André, H.-J. Gabius, B. Richichi,* J. Jiménez-Barbero,* C. Nativi*

Structural Insights into the Binding of Sugar Receptors (Lectins) to a Synthetic Tricyclic Tn Mimetic and Its Glycopeptide Version

A mimetic of the tumor-associated Tn antigen (CD175) and its glycopeptide interacts differently with lectins from a plant, a snail, and human macrophages. The conformation of the mimetic and the lectins' binding site topology contribute to the variation. Extrapolations about ligand recognition should thus be considered carefully, even for lectins that share specificity for a given monosaccharide.



Eur. J. Org. Chem.
DOI: 10.1002/ejoc.201500874



ChemistryOpen

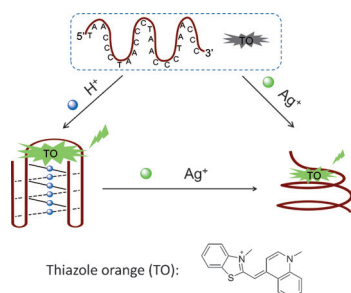
DOI: 10.1002/open.201500074

Computational Chemistry

Y. Duan,* C. D. Stinespring, B. Chorpene

Electronic Structures, Bonding Configurations, and Band-Gap-Opening Properties of Graphene Binding with Low-Concentration Fluorine

Buckling and band gaps: Introducing a band gap in graphene is useful for many applications. Creating defects and covalent binding with other atoms are effective ways to open the band gap. We investigate the structure and impact of low-level fluorine defects on the electrical properties of graphene and show that the band-gap opening depends not only on the fluorine doping level, but also on the configurations of fluorine binding.



Asian J. Org. Chem.

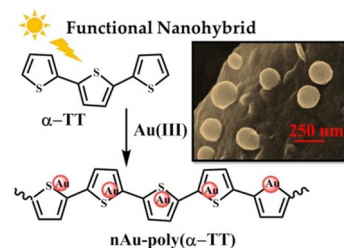
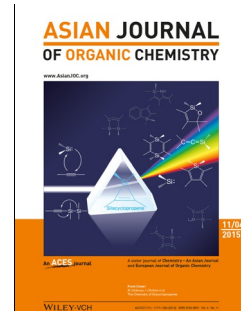
DOI: 10.1002/ajoc.201500347

DNA i-Motif

L. Xu, X. Shen, S. Hong, J. Wang, L. Zhou, X. Chen, R. Pei*

Thiazole Orange as a Fluorescent Light-Up Probe for the i-Motif and its Application to the Development of a Molecular Logic System

TO's company: Thiazole orange (TO) as a fluorescent probe for H⁺-induced i-motif formation is reported. TO fluoresces in the presence of the folded structures of i-motif DNA sequences and H⁺ and/or Ag⁺ ions, which allows the design of an "OR" logic gate.



ChemNanoMat

DOI: 10.1002/cnma.201500111

Nanotechnology

R. K. Bera, P. Bhunia, S. Chakrabarty, C. R. Raj*

Visible-Light-Driven Production of Poly(α-terthiophene)-Au Nanoparticle Functional Hybrid Material

A visible-light-driven approach for the synthesis of electrocatalytically and photoelectrocatalytically active Au nanoparticle-poly(α-terthiophene) functional hybrid material is demonstrated. The nanoparticles effectively suppress electron-hole recombination and enhance the photoelectrochemical response.



ChemViews magazine

DOI: 10.1002/chemv.201500064

Safety

V. Koester

Process Safety – Industry-Wide Discipline

Shakeel Kadri, Executive Director of the Center for Chemical Process Safety (CCPS) of the American Institute of Chemical Engineers (AIChE), talks to Vera Koester for ChemViews Magazine about improving industrial process safety worldwide and how this is supported by the desire of industry to minimize major incidents.

