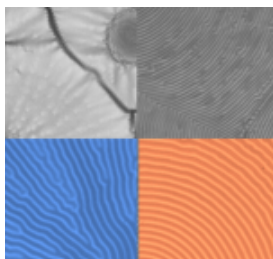


Hot Topics

WILEY-VCH



Surfaces and Interfaces



Interfaces and surfaces are where the action happens. Catalysis, molecular recognition, charge transfer, polymerization and many other critical processes take place at the boundary between one medium and another. With the need to integrate new materials into devices, and applications ranging from catalysis to sensors, medicine to self-cleaning surfaces, and displays to lasers, fundamental and applied studies of surface and interface processes and optimization are of critical importance in developing new technology to meet today's challenges. The selection of recent research articles presented below illustrates the vast potential of this field.

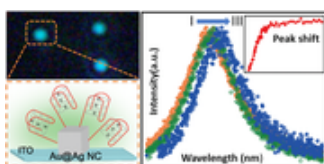
For recent reviews, see

- F. Xia, L. Jiang
[Bio-Inspired, Smart, Multiscale Interfacial Materials](#)
- J. Xu et al.
[Facile Creation of Biomimetic Systems at the Interface and in Bulk](#)
- G. Ertl
[Reactions at Surfaces: From Atoms to Complexity \(Nobel Lecture\)](#)



Recent Articles

An Individual Nanocube-Based Plasmonic Biosensor for Real-Time Monitoring the Structural Switch of the Telomeric G-Quadruplex

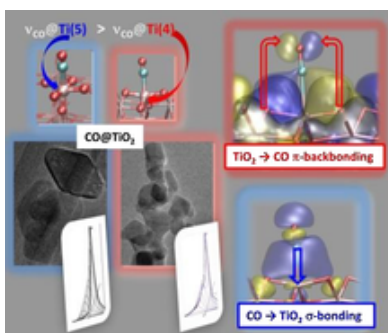


A novel plasmonic nanoaptasensor based on an individual Au@Ag core-shell nanocube has been proposed for real-time monitoring the dynamic formation process of G-quadruplex structures and the label-free analysis of potassium ions. The analysis of the thermodynamic parameters indicates that there are two types of binding states accompanied with a remarkable change of the free energy (ΔG) in the sequential folding process of telomere DNA sequence.

[Full Paper]

Yuanyuan Tian, Lei Zhang, Jingjing Shen, Lingzhi Wu, Hongzhang He, Dik-Lung Ma, Chung-Hang Leung, Weibing Wu, Quli Fan, Wei Huang, Lianhui Wang
Small, April 23, 2016, DOI: 10.1002/smll.201600041. [Read article](#)

On the Simple Complexity of Carbon Monoxide on Oxide Surfaces: Facet-Specific Donation and Backdonation Effects Revealed on TiO₂ Anatase Nanoparticles



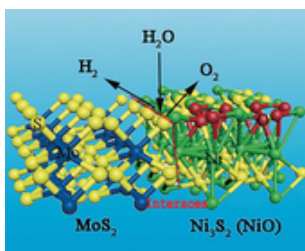
Back and forth: IR and modeling studies on TiO₂ nanoparticles reveal that the stretching frequency of adsorbed CO results from a synergic donation/backdonation mechanism, by which the surface oxygen anions act as electron donors even if not directly bonded to the adsorbate.

[Communication]

Chiara Deiana, Ettore Fois, Gianmario Martra, Stéphanie Narbey, Francesco Pellegrino, Gloria Tabacchi
ChemPhysChem, April 23, 2016, DOI: 10.1002/cphc.201600284. [Read article](#)

Interface Engineering of MoS₂/Ni₃S₂ Heterostructures for Highly Enhanced Electrochemical Overall-Water-Splitting Activity

Split happens: The preparation of novel MoS₂/Ni₃S₂ heterostructures with abundant interfaces shows that these

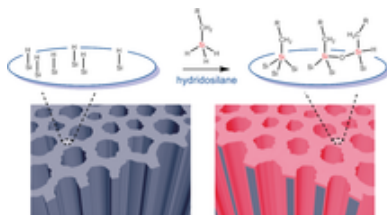


interfaces synergistically favor the chemisorption of hydrogen and oxygen-containing intermediates, thus leading to highly enhanced water-splitting activity. DFT calculations support these findings.

[Communication]

Jian Zhang, Tao Wang, Darius Pohl, Bernd Rellinghaus, Renhao Dong, Shaohua Liu, Xiaodong Zhuang, Xinliang Feng
Angew. Chem. Int. Ed., April 21, 2016, DOI: 10.1002/anie.201602237. [Read article](#)

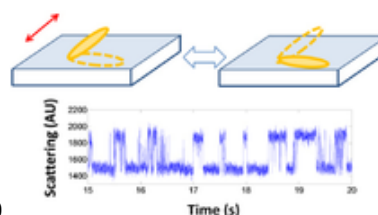
Thermally Induced Silane Dehydrocoupling on Silicon Nanostructures



Organic trihydridosilanes were grafted to hydrogen-terminated porous Si nanostructures with no catalyst. When intrinsically photoluminescent porous Si films or nanoparticles are used, photoluminescence is retained in the grafted products, indicating that the chemistry does not introduce substantial nonradiative surface traps.

[Communication]

Dokyoung Kim, Jinmyoung Joo, Youlin Pan, Alice Boarino, Yong Woong Jun, Kyo Han Ahn, Barry Arkles, Michael J. Sailor
Angew. Chem. Int. Ed., April 21, 2016, DOI: 10.1002/anie.201601010. [Read article](#)



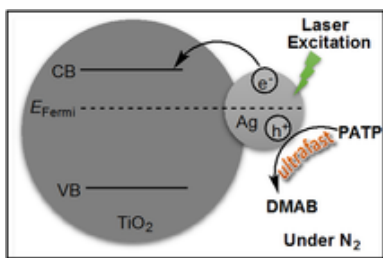
]]> <http://dx.doi.org/10.1002/cphc.201600174> 2016-04-20

In a spin: A nanosecond time-resolution study yields new insights into the rotational motion of anchored rod-like nanoparticles at the liquid–solid interface. The continuous rotation observed under low temporal resolution is found to be comprised of numerous fast, intermittent transitions between a limited number of weakly immobilized states.

[Article]

Bhanu Neupane, Fang Chen, Yanli Wei, Ning Fang, Frances S. Ligler, Gufeng Wang
ChemPhysChem, April 20, 2016, DOI: 10.1002/cphc.201600174. [Read article](#)

Ultrafast Surface-Plasmon-Induced Photodimerization of *p*-Aminothiophenol on Ag/TiO₂ Nanoarrays

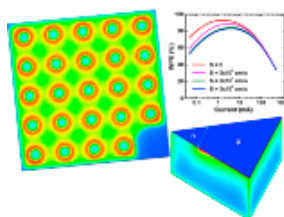


Extremely quick: Ultrafast photodimerization of *p*-aminothiophenol (PATP) into *p,p'*-dimercaptobenzene (DMAB) is demonstrated on the hybrid system of Ag/TiO₂ through visible-light laser excitation, even under inert-gas atmosphere. Hot electrons transfer to the conduction band (CB) of TiO₂, and the generated holes trigger the conversion.

[Full Paper]

Jiayu Chu, Peng Miao, Xijiang Han, Yunchen Du, Xianjie Wang, Bo Song, Ping Xu
ChemCatChem, April 18, 2016, DOI: 10.1002/cctc.201600172. [Read article](#)

Impact of surface recombination on efficiency of III-nitride light-emitting diodes



This Letter demonstrates that surface recombination at the periphery of the active region is an important mechanism of carrier losses, which has not yet been regarded as a factor capable of limiting the efficiency of InGaN-based LEDs. The impact of non-equilibrium carrier diffusivity and lifetime on the recombination losses is discussed in terms of simulations.

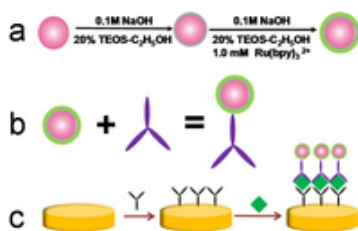
[Rapid Research Letter]

Kirill A. Bulashevich, Sergey Yu. Karpov
Phys. Status Solidi RRL, April 13, 2016, DOI: 10.1002/pssr.201600059. [Read article](#)

Surface Enhanced Electrochemiluminescence Immunoassay for Highly Sensitive Detection of Disease Biomarkers in Whole Blood

[Short Communication]

Runping Yang, Yuanlin Liu, Huazhen Ye, Bin Qiu, Zhenyu Lin, Longhua Guo
Electroanalysis, April 13, 2016, DOI: 10.1002/elan.201600125. [Read article](#)



Misfit Dislocation Guided Topographic and Conduction Patterning in Complex Oxide Epitaxial Thin Films



Misfit dislocations in $\text{La}_{0.7}\text{Sr}_{0.3}\text{MnO}_3/\text{LaAlO}_3$ compressively strained heterostructures

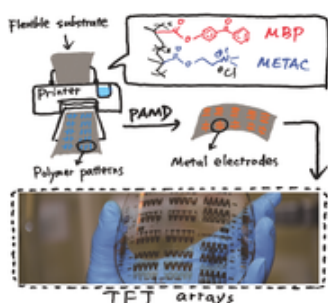
are shown to induce topographic and surface current patterning. The underpinning mechanism of this behavior is a lateral modulation of surface strain influencing the chemical potential ($\Delta\mu$) and the bandwidth (W) at the free surface, providing a clue for the realization of spontaneous functional nanostructures in the ≈ 20 nm range.

[Full Paper]

Felip Sandiumenge, Núria Bagués, José Santiso, Markos Paradinas, Alberto Pomar, Zorica Konstantinovic, Carmen Ocal, Lluís Balcells, Marie-Jo Casanove, Benjamín Martínez

Adv. Mater. Interfaces, April 13, 2016, DOI: 10.1002/admi.201600106. [Read article](#)

Photoreactive and Metal-Platable Copolymer Inks for High-Throughput, Room-Temperature Printing of Flexible Metal Electrodes for Thin-Film Electronics



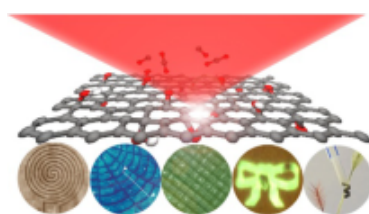
Photoreactive and metal-platable copolymer inks are reported for the first time to allow high-throughput printing of high-performance flexible electrodes at room temperature. This new copolymer ink accommodates various types of printing technologies, such as soft lithography molding, screen printing, and inkjet printing. Electronic devices including resistors, sensors, solar cells, and thin-film transistors fabricated with these printed electrodes show excellent electrical performance and mechanical flexibility.

[Communication]

You Yu, Xiang Xiao, Yaokang Zhang, Kan Li, Casey Yan, Xiaoling Wei, Lina Chen, Hongyu Zhen, Hang Zhou, Shengdong Zhang, Zijian Zheng

Adv. Mater., April 13, 2016, DOI: 10.1002/adma.201505119. [Read article](#)

Surface and Interface Engineering of Graphene Oxide Films by Controllable Photoreduction



Shining a light on photoreduction: Engineering of the surface/interface properties of graphene oxides by controllable photoreduction is presented. Typical photoreduction processes, including femtosecond laser direct writing, laser holographic lithography, and controllable UV irradiation, have been summarized. The photoreduction strategy shows distinct advantages, such as mask-free patterning, chemical-free modification, controllable reduction degree, and environmentally friendly processing; thus it holds great promise for the development of graphene-based devices.

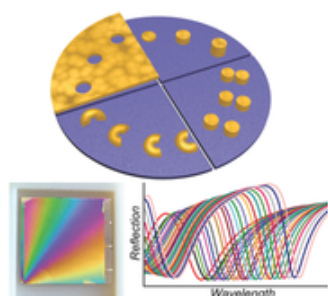
[Personal Account]

Yu-Qing Liu, Yong-Lai Zhang, Yan Liu, Hao-Bo Jiang, Dong-Dong Han, Bing Han,

Jing Feng, Hong-Bo Sun

The Chemical Record, April 09, 2016, DOI: 10.1002/tcr.201500306. [Read article](#)

Continuous-Gradient Plasmonic Nanostructures Fabricated by Evaporation on a Partially Exposed Rotating Substrate



A continuous-gradient approach of material evaporation is employed to fabricate nanostructures with varying geometric parameters such as thickness, lateral positioning, and orientation on a single substrate. The method developed for mask-lithography allows continuous tuning of the physical properties of a sample. The technique is highly valuable in simplifying the overall optimization process for constructing metasurfaces.

[Communication]

Robin Ogier, Lei Shao, Mikael Svedendahl, Mikael Käll

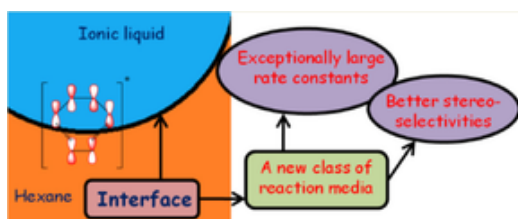
Adv. Mater., April 09, 2016, DOI: 10.1002/adma.201600112. [Read article](#)

Spectacular Rate Enhancement of the Diels–Alder Reaction at the Ionic Liquid/*n*-Hexane Interface

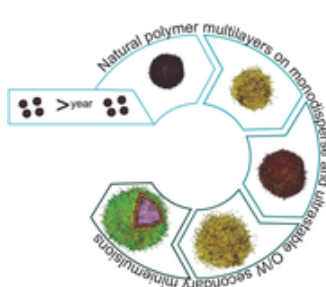
At the interface: Ionic liquid/*n*-hexane interfaces are used as a new class of reaction media for the Diels–Alder reaction. The high polarities of ionic liquids and availability of hydrogen bonding and solvophobic interactions stabilizes the transition state, resulting in large rate constants and better *endo* selectivity.

[Communication]

Vijay Beniwal, Arpan Manna, Anil Kumar
ChemPhysChem, April 08, 2016, DOI: 10.1002/cphc.201600006. [Read article](#)



Ultrastable Liquid–Liquid Interface as Viable Route for Controlled Deposition of Biodegradable Polymer Nanocapsules

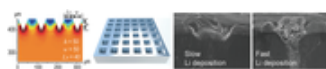


The preparation of an ultrastable liquid–liquid interface based on an O/W secondary miniemulsion has enabled its use as effective template for the self-assembly of polymeric multilayer nanocapsules made of entirely biodegradable materials, with highly controlled size—well under 200 nm—and capability to embed lipophilic drugs together with multifunctional features typical of polymer multilayer nanocapsules.

[Full Paper]

Raffaele Vecchione, Giulia Iaccarino, Paolo Bianchini, Roberto Marotta, Francesca D'autilia, Vincenzo Quagliariello, Alberto Diaspro, Paolo A. Netti
Small, April 06, 2016, DOI: 10.1002/smll.201600347. [Read article](#)

Micro-Patterned Lithium Metal Anodes with Suppressed Dendrite Formation for Post Lithium-Ion Batteries

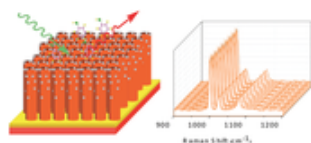


In a collaboration between COMSOL simulation based on a finite element method and post-mortem analysis, this study visualizes and predicts the Li stripping/deposition behavior of the surface modified Li metal during cycling. Surface-patterned Li metal having an optimized pattern dimension improves cycle retention abilities and power capabilities, as suppressing Li dendrite growth formation, to those of the bare Li metal.

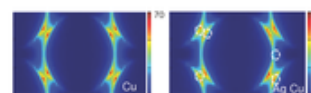
[Full Paper]

Joonam Park, Jiseon Jeong, Yunju Lee, Min Oh, Myung-Hyun Ryou, Yong Min Lee
Adv. Mater. Interfaces, April 06, 2016, DOI: 10.1002/admi.201600140. [Read article](#)

Highly Ordered Ag/Cu Hybrid Nanostructure Arrays for Ultrasensitive Surface-Enhanced Raman Spectroscopy



By effectively tuning the gap size and the density of the Cu nanorods, the detection limit of benzenethiol can be as low as 10^{-10} M. With a thin layer of Ag coated on top, the surface-enhanced Raman spectroscopy (SERS) sensitivity of the Cu/Ag hybrid nanostructure can be further enhanced, capable of detecting SERS signal of benzenethiol in a 10^{-15} M solution.



[Full Paper]

Kun Chen, Xinyi Zhang, Yongliang Zhang, Dang Yuan Lei, Haitao Li, Timothy Williams, Douglas R. MacFarlane
Adv. Mater. Interfaces, April 06, 2016, DOI: 10.1002/admi.201600115. [Read article](#)

Current Status and Future Prospect of Polymer-Layered Silicate Mixed-Matrix Membranes for CO₂/CH₄ Separation



Mixed-matrix membranes (MMMs) were developed to overcome the limitations of polymeric and inorganic membranes and are regarded as state-of-the-art polymer-inorganic hybrids. Potential applications of layered silicates as inorganic fillers in MMM fabrication for CO₂/CH₄ separation are reviewed together with challenges for successful formation of layered silicate-based MMMs and future prospects.

[Research Article]

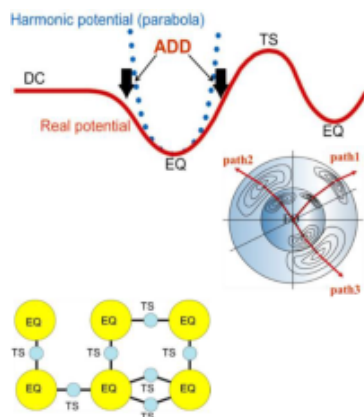
Asif Jamil, Oh Pei Ching, Azmi B. M. Shariff
Chem. Eng. Technol., April 5, 2016, DOI: 10.1002/ceat.201500395. [Read article](#)

Study of Potential Energy Surfaces towards Global Reaction Route Mapping

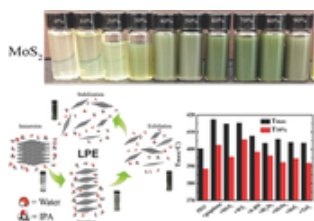
Anharmonic downward distortion (ADD), indicated by the arrows, plays the role of a guidepost in the scaled hypersphere search method for searching reaction pathways connecting EQ, TS, and DC on the potential energy surface, one after another, to complete global reaction route mapping.

[Personal Account]

Koichi Ohno
The Chemical Record, April 05, 2016, DOI: 10.1002/tcr.201500284. [Read article](#)



Surface Tension Components Based Selection of Cosolvents for Efficient Liquid Phase Exfoliation of 2D Materials

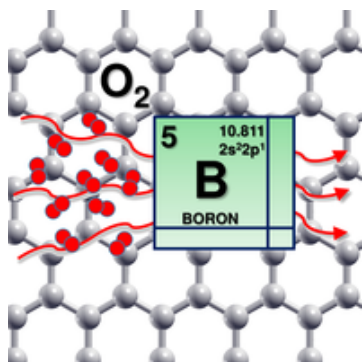


Low boiling points cosolvents with proper surface tension components are used for the efficient direct liquid phase exfoliation (LPE) of different 2D materials and the library of solvents for direct LPE is enlarged to infinite theoretically. With the addition of prepared 2D materials, thermal and mechanical properties of composites are greatly increased, corresponding to the intrinsic properties and LPE capacity of 2D materials.

[Full Paper]

Jianfeng Shen, Jingjie Wu, Man Wang, Pei Dong, Jingxuan Xu, Xiaoguang Li, Xiang Zhang, Junhua Yuan, Xifan Wang, Mingxin Ye, Robert Vajtai, Jun Lou, Pulickel M. Ajayan *Small*, April 05, 2016, DOI: 10.1002/smll.201503834. [Read article](#)

Theoretical Studies of Oxygen Reactivity of Free-Standing and Supported Boron-Doped Graphene

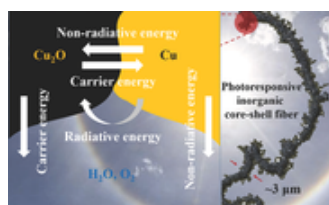


Boron found to matter: Advanced density functional studies on the enhancement of oxygen reactivity through non-metal doping and/or interfacial graphene with metal (copper) and semiconductor (TiO₂) surfaces are reviewed. Oxidized boron species are formed in the graphene sheets. These are bound to the underlying support through direct covalent bonds, which enhances the intimate connection between materials with different chemical and physical properties, thus creating an interactive hybrid interface.

[Review]

Cristiana Di Valentin, Lara Ferrighi, Gianluca Fazio *ChemSusChem*, March 31, 2016, DOI: 10.1002/cssc.201501439. [Read article](#)

Reagent-Free Synthesis and Plasmonic Antioxidation of Unique Nanostructured Metal–Metal Oxide Core–Shell Microfibers

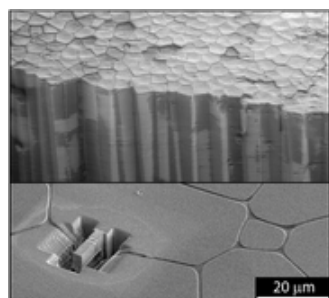


A photoresponsive inorganic microfiber with a plasmonic core–shell structure responds to visible light to achieve self-protection against oxidation in an open environment. The microfibers are synthesized via a newly developed reagent-free electrolytic method and have unique interfacial structures and high surface activity.

[Communication]

Chengyi Hou, Minwei Zhang, Takeshi Kasama, Christian Engelbrekt, Lili Zhang, Hongzhi Wang, Qijin Chi *Adv. Mater.*, March 31, 2016, DOI: 10.1002/adma.201505990. [Read article](#)

Inherent Role of Water in Damage Tolerance of the Prismatic Mineral–Organic Biocomposite in the Shell of *Pinna nobilis*

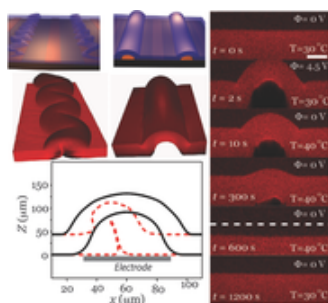


Mechanical performance of the prismatic calcite-organic biocomposite structure in the shell of the bivalve mollusc *Pinna nobilis* is strongly dependent on high moisture content inherent to its marine habitat. Water is not only an integral structural component but also plays a key role in various toughening mechanisms responsible for the high damage tolerance of the shell.

[Full Paper]

Bernd Bayerlein, Luca Bertinetti, Benny Bar-On, Horst Blumtritt, Peter Fratzl, Igor Zlotnikov *Adv. Funct. Mater.*, March 30, 2016, DOI: 10.1002/adfm.201600104. [Read article](#)

Reversible Electrochemically Triggered Delamination Blistering of Hydrogel Films on Micropatterned Electrodes



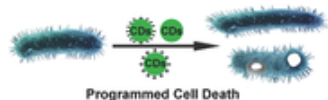
Delamination and buckling of hydrogels in a controlled, localized, and reversible manner are demonstrated using electrochemical-triggered debonding and inflation of a gas bubble. The process provides rapid and large amplitude out-of-plane displacements, while thermally induced deswelling of the gel allows devices to be reset and actuated over multiple cycles.

[Full Paper]

Ben B. Xu, Qihan Liu, Zhigang Suo, Ryan C. Hayward

Adv. Funct. Mater., March 30, 2016, DOI: 10.1002/adfm.201504769. [Read article](#)

Programmed Bacteria Death Induced by Carbon Dots with Different Surface Charge



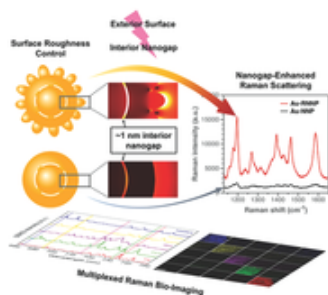
Based on a series of biochemical experiments for analysis and characterization, it is found that the uncharged C-dots have no effect on bacterial growth while the negatively charged and positively charged C-dots can induce bacteria apoptosis. For the positively charged C-dots, they can induce both bacteria apoptosis and bacteria death. These observations will provide new insights into bioapplications of carbon dots.

[Communication]

Wei Bing, Hanjun Sun, Zhengqing Yan, Jinsong Ren, Xiaogang Qu

Small, March 29, 2016, DOI: 10.1002/smll.201600294. [Read article](#)

Synthesis, Optical Properties, and Multiplexed Raman Bio-Imaging of Surface Roughness-Controlled Nanobridged Nanogap Particles



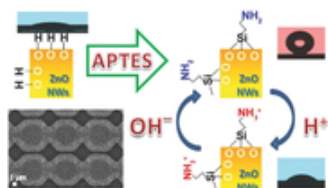
A facile, high-yield synthetic strategy to generate Au surface roughness-controlled nanobridged nanogap particles (Au-RNNPs) with ultrasmall (≈ 1 nm) interior gap and tunable surface roughness is introduced. Very strong plasmonic nanogap-enhanced Raman scattering signals inside the interior gap can be generated by controlling particle surface roughness and the number of nanobridges. The Au-RNNPs show excellent potential for sensitive, multiplexed Raman bio-imaging with a rapid, wide-field Raman imaging setup.

[Full Paper]

Jung-Hoon Lee, Jeong-Wook Oh, Sang Hwan Nam, Yeong Seok Cha, Gyeong-Hwan Kim, Won-Kyu Rhim, Nam Hoon Kim, Jongwoo Kim, Sang Woo Han, Yung Doug Suh, Jwa-Min Nam

Small, March 29, 2016, DOI: 10.1002/smll.201600289. [Read article](#)

How Micropatterning and Surface Functionalization Affect the Wetting Behavior of ZnO Nanostructured Surfaces



The wetting behavior of zinc oxide nanowires (NWs) can be tuned between superhydrophobic and superhydrophilic states by combining surface chemical functionalization and prepatterned substrates. Protonation/deprotonation of amine-groups interacting with acidic or basic media induces the ZnO NW wetting transition. The reversibility is promoted by ad-hoc pattern geometries, preventing the entrapment of air bubbles.

[Full Paper]

Marco Laurenti, Alessio Verna, Marco Fontana, Stefano Stassi, Giancarlo Canavese,

Simone L. Marasso, Valentina Cauda

Adv. Mater. Interfaces, March 29, 2016, DOI: 10.1002/admi.201600110. [Read article](#)

Surface Energy-Mediated Self-Patterning for High Performance Spray-Deposited Organic Field Effect Transistors



Cost-effective spray deposition methodologies to fabricate high-performance large-scale patterned organic field effect transistors via surface energy-mediated self-patterning of organic semiconductors are presented in this study.

[Communication]

Han-Wen Hsu, Wei-Chieh Chang, Shih-Huang Tung, Cheng-Liang Liu

Adv. Mater. Interfaces, March 29, 2016, DOI: 10.1002/admi.201500714. [Read article](#)

Imine functionalized triazatriangulenium platforms: towards an artificial ciliated epithelium

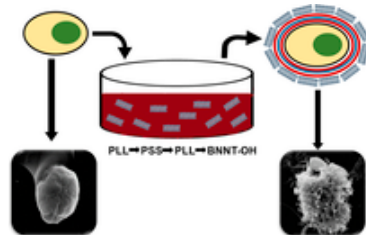
Abstract: Triazatriangulenium (TATA) platforms have been used to prepare highly ordered, self-assembled monolayers of

free and vertically standing imines on Au(111) surfaces. Upon irradiation the imines undergo trans cis isomerization and a fast thermal reaction ($t_{1/2} = 0.58$ s at 20 °C) back to the more stable trans form. It is known that the photochemical reaction proceeds via rotation of the C=N bond and the thermochemical reaction via inversion at the N atom. The imine motors therefore should be able to induce a net displacement of particles above the surface similar to cilia epithelia in nature.

[Communication]

Rainer Herges, Melanie Hammerich, Talina Rusch, Nicolai R. Krekieln, Andreas Bloedom, Olaf M. Magnussen
ChemPhysChem, March 27, 2016, DOI: 10.1002/cphc.201600147. [Read article](#)

Boron Nitride Nanotubes and Layer-By-Layer Polyelectrolyte Coating for Yeast Cell Surface Engineering

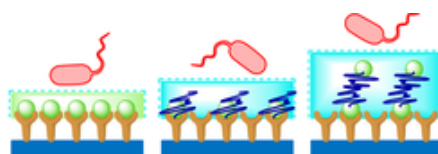
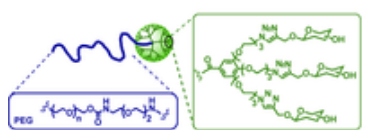


Saccharomyces cerevisiae cells are encapsulated with polyelectrolytes (poly-L-lysine and polystyrene sulfonate) and hydroxylated boron nitride nanotube structures. The image shows schematic and SEM images of yeast cells before and after the encapsulation process in sodium chloride.

[Communication]

Melis Emanet, Rawil Fakhruilin, Mustafa Çulha
ChemNanoMat, March 24, 2016, DOI: 10.1002/cnma.201600044. [Read article](#)

The Effect of PEGylation on Multivalent Binding: A Surface Plasmon Resonance and Isothermal Titration Calorimetry Study with Structurally Diverse PEG-Dendritic GATG Copolymers



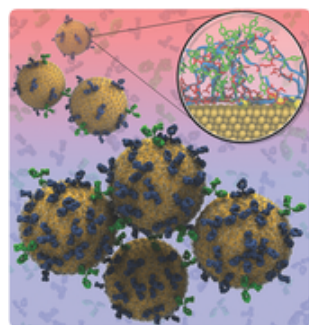
To bind or not to bind? A general synthetic strategy to glycosylated PEG-GATG (polyethylene glycol-gallic acid triethylene glycol) block copolymers is described as a toolbox to analyze the steric stabilization of PEG (various molecular weights and architectures) on the multivalent binding with lectins by surface

plasmon resonance (SPR) and isothermal titration calorimetry (ITC).

[Full Paper]

Marcos Fernandez-Villamarin, Ana Sousa-Herves, Juan Correa, Eva Maria Munoz, Pablo Taboada, Ricardo Riguera, Eduardo Fernandez-Megia
ChemNanoMat, March 24, 2016, DOI: 10.1002/cnma.201600008. [Read article](#)

Understanding and Designing the Gold–Bio Interface: Insights from Simulations

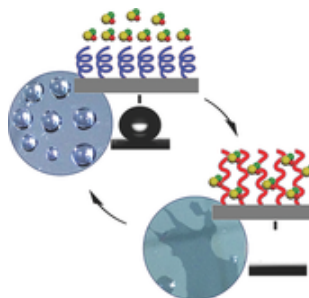


Gold nanoparticles are an integral part of novel biomedical technologies. The successes and challenges for computational modeling techniques in facilitating the design of gold nanomaterials for biomedicine are reviewed. The multiscale theoretical modeling, covering physicochemical as well as biologically relevant interactions of nanogold with biomolecules not accessible to experiments, is essential for the rational design of efficient gold nanomaterials for biomedical applications.

[Review]

Patrick Charchar, Andrew J. Christofferson, Nevena Todorova, Irene Yarovsky
Small, March 23, 2016, DOI: 10.1002/smll.201503585. [Read article](#)

Smart Polymers with Special Wettability



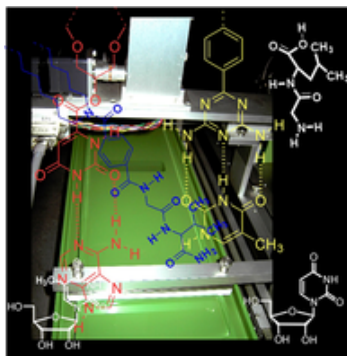
Smart polymers based on synergetic noncovalent interactions serving as biointerface materials, functionally similar to biotic membranes with marvelous efficiency and exquisite enantioselectivity, can transform weak signals of molecular and chiral recognitions into changes of macroscopic performances (e.g., wettability, stiffness, adhesion, and self-healing), and have furthered advances in numerous aspects of biology and our daily life.

[Review]

Baisong Chang, Bei Zhang, Taolei Sun
Small, March 23, 2016, DOI: 10.1002/smll.201503472. [Read article](#)

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.

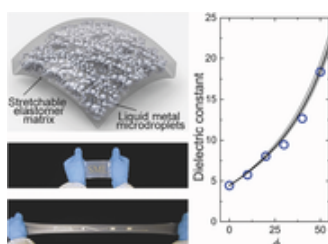


[Focus Review]

Katsuhiko Ariga

ChemNanoMat, March 23, 2016, DOI: 10.1002/cnma.201600053. [Read article](#)

Stretchable, High- k Dielectric Elastomers through Liquid-Metal Inclusions



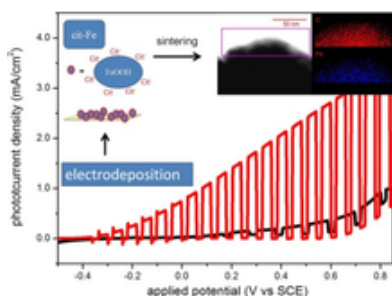
An all-soft-matter composite with exceptional electro-elasto properties is demonstrated by embedding liquid-metal inclusions in an elastomer matrix. This material exhibits a unique combination of high dielectric constant, low stiffness, and large strain limit (ca. 600% strain). The elasticity, electrostatics, and electromechanical coupling of the composite are investigated, and strong agreement with predictions from effective medium theory is found.

[Communication]

Michael D. Bartlett, Andrew Fassler, Navid Kazem, Eric J. Markvicka, Pratiti Mandal, Carmel Majidi

Adv. Mater., March 23, 2016, DOI: 10.1002/adma.201506243. [Read article](#)

Carbon-Coated Hematite Electrodes with Enhanced Photoelectrochemical Performance Obtained through an Electrodeposition Method with a Citric Acid Additive



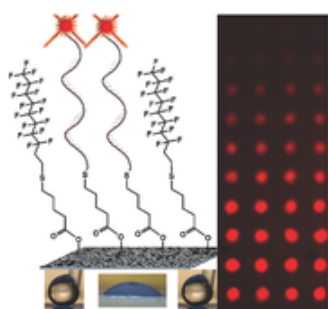
A light jacket: Hematite electrodes with a carbon coating layer are obtained by using a simple electrodeposition method in an electrolyte containing citric acid additives. The carbon-coated electrodes exhibit a high photoelectrochemical performance with a photocurrent density of 2.1 mA cm^{-2} at 0.4 V versus SCE.

[Article]

TsingHai Wang, Yi-Nuo Chen, Chia-Che Chiang, Yi-Kong Hsieh, Po-Chieh Li, Chu-Fang Wang

ChemElectroChem, March 22, 2016, DOI: 10.1002/celc.201600060. [Read article](#)

Versatile and Easy Fabrication of Advanced Surfaces for High Performance DNA Microarrays



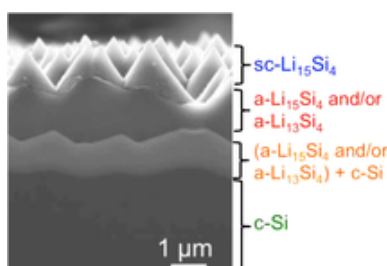
A new type of material for application in high performance DNA detection is described. By combining the material, surface, probe attachment, and target recognition with modulation of the surface hydrophobicity/hydrophilicity properties, advanced microarrays with improved performance are obtained, characterized, and tested.

[Communication]

Daniel González-Lucas, María-José Bañuls, Rosa Puchades, Ángel Maquieira

Adv. Mater. Interfaces, March 22, 2016, DOI: 10.1002/admi.201500850. [Read article](#)

Structural Study of Electrochemically Lithiated Si(111) by using Soft X-ray Emission Spectroscopy Combined with Scanning Electron Microscopy and through X-ray Diffraction Measurements



Three's a crowd: Electrochemically lithiated Si forms three phases on a Si(111) substrate, that is, a single-crystalline $\text{Li}_{15}\text{Si}_4$ (sc- $\text{Li}_{15}\text{Si}_4$) alloy phase with a three-fold symmetric triangular pyramid shape, which reflects the atomic arrangement of Si(111), an amorphous phase of $\text{Li}_{15}\text{Si}_4$ and/or $\text{Li}_{13}\text{Si}_4$ (a- $\text{Li}_{15}\text{Si}_4$ and/or a- $\text{Li}_{13}\text{Si}_4$), and a mixed phase of a- $\text{Li}_{15}\text{Si}_4$ and/or a- $\text{Li}_{13}\text{Si}_4$ alloys (52 %) and crystalline Si (c-Si) (48 %).

[Article]

Nana Aoki, Asami Omachi, Kohei Uosaki, Toshihiro Kondo

ChemElectroChem, March 21, 2016, DOI: 10.1002/celc.201600030. [Read article](#)

Experimental and Numerical Simulation of Dry Pressure Drop in High-Capacity Structured Packings

The performance of a structured packing is strongly related to the variation of the pressure



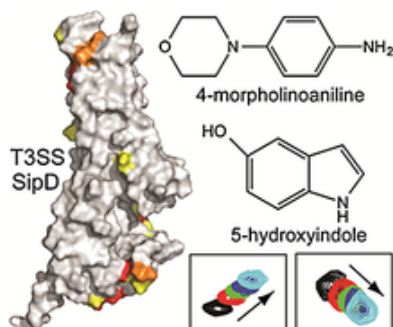
along the flow stream. Experiments and computational analyses were performed to investigate the potential benefits of an innovative wire gauze structured packing. Various conditions and evaluations such as packing angles and comparison of commercial packings were studied.

[Research Article]

Younes Amini, Javad Karimi-Sabet, Mohsen Nasr Esfahany

Chem. Eng. Technol., March 18, 2016, DOI: 10.1002/ceat.201500477. [Read article](#).

Characterization of the Binding of Hydroxyindole, Indoleacetic acid, and Morpholinoaniline to the *Salmonella* Type III Secretion System Proteins SipD and SipB

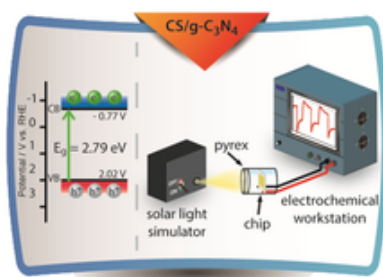


Because of its critical role in virulence, the bacterial type III secretion system (T3SS) is an attractive target for developing new antibiotics. A screen based on surface plasmon resonance and NMR identified new small-molecule fragments that bind to the tip protein SipD and the translocon protein SipB of the *Salmonella* T3SS. These proteins are important in T3SS, and the new fragments can be used for designing novel inhibitors that can disrupt the T3SS and render bacteria non-infective.

[Full Paper]

Andrew C. McShan, Asokan Anbanandam, Sikta Patnaik, Roberto N. De Guzman
ChemMedChem, March 18, 2016, DOI: 10.1002/cmdc.201600065. [Read article](#)

Photoactivity of g-C₃N₄/S-Doped Porous Carbon Composite: Synergistic Effect of Composite Formation

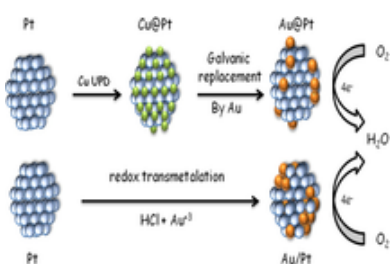


Composite activity: A composite of g-C₃N₄ with visible-light photoactive S-doped carbon is synthesized. The resulting material is conductive, porous, and rich in specific surface chemistry based on sulfur-surface functionality of the carbon phase, nitrogen species arrangement of g-C₃N₄, and new oxidized species formed on the interface. The composite shows enhanced activity for electroreduction processes under visible light and outperforms its components.

[Communication]

Mykola Seredych, Szymon Łoś, Dimitrios A. Giannakoudakis, Enrique Rodríguez-Castellón, Teresa J. Bandoz
ChemSusChem, March 15, 2016, DOI: 10.1002/cssc.201501658. [Read article](#)

Electrochemical Study of Oxygen Reduction on a Carbon-Supported Core–Shell Platinum–Gold Electro catalyst with Tuneable Gold Surface Composition



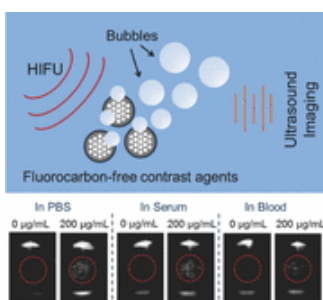
Bad neighbour: Core-shell Pt–Au nanoparticles are synthesised by two different methods. The effects of the deposition method and the nanoparticle surface coverage of gold on the oxygen reduction reaction are investigated.

[Article]

Ijjada Mahesh, A. Sarkar

ChemElectroChem, March 15, 2016, DOI: 10.1002/celec.201500452. [Read article](#)

Stable Encapsulation of Air in Mesoporous Silica Nanoparticles: Fluorocarbon-Free Nanoscale Ultrasound Contrast Agents



A fluorocarbon-free nanoscale ultrasound contrast agent is described based on mesoporous silica particles with hydrophobic interiors and resuspension in an amphiphilic copolymer. Administration of high intensity focused ultrasound (HIFU) produces macroscopic bubbles, in the presence of down to 10¹⁰ nanoparticles particles mL⁻¹. These agents provide ultrasound contrast in biological media, and imaging was sustained continuously for at least 20 min.

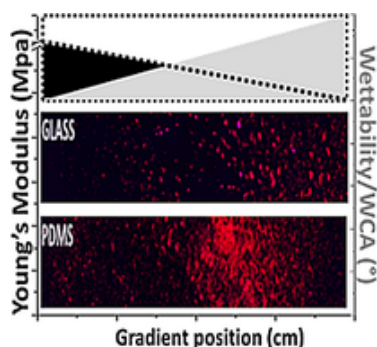
[Full Paper]

Adem Yildirim, Rajarshi Chattaraj, Nicholas T. Blum, Galen M. Goldscheitter, Andrew P. Goodwin

Adv. Healthcare Mater., March 15, 2016, DOI: 10.1002/adhm.201600030. [Read article](#)

Double Linear Gradient Biointerfaces for Determining Two-Parameter Dependent Stem Cell Behavior

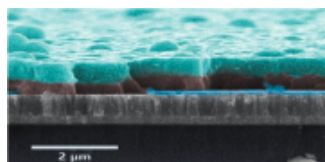
Two are better than one: Two-parameter contributions of stiffness and wettability display altered behavior of human bone marrow derived mesenchymal stem cells (hBM-MSCs) as compared to solely investigating the wettability of the biointerface with a homogenous stiffness. The importance of double parameter influence is investigated by using newly developed double linear wettability–stiffness gradients.



[Communication]

Philipp T. Kühn, Qihui Zhou, Torben A. B. van der Boon, Aneta M. Schaap-Oziemlak, Theo G. van Kooten, Patrick van Rijn
ChemNanoMat, March 10, 2016, DOI: 10.1002/cnma.201600028. [Read article](#)

Optoelectrical improvement of ultra-thin Cu(In,Ga)Se₂ solar cells through microstructured MgF₂ and Al₂O₃ back contact passivation layer



This work introduces large-area passivation in ultra-thin Cu(In,Ga)Se₂ (CIGS) solar cells between the 500 nm thick absorber and the Mo back contact. The influence of two materials, MgF₂ and Al₂O₃, has been investigated in combination with high contact-to-contact distances. Distances of up to 9 μm (75% passivation coverage) resulted in an increase in power conversion efficiency of up to 9%_{rel} compared to an unpassivated cell design.

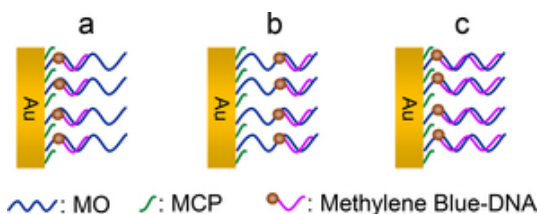


[rrl solar]

Pascal Casper, Ruben Hünig, Guillaume Gomard, Oliver Kiowski, Christian Reitz, Uli Lemmer, Michael Powalla, Michael Hetterich

Phys. Status Solidi RRL, March 09, 2016, DOI: 10.1002/pssr.201600018. [Read article](#)

An Electrochemical Study of the Surface Hybridization Process of Morpholino-DNA: Thermodynamics and Kinetics

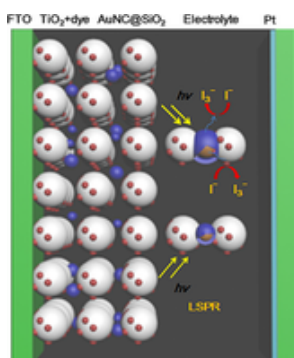


[Full Paper]

Yakai He, Jing Zhang, Sade Ruffin, Lina Ji, Kang Wang, Rastislav Levicky, Xinghua Xia

Electroanalysis, March 08, 2016, DOI: 10.1002/elan.201501109. [Read article](#)

Plasmon-Induced Broadband Light-Harvesting for Dye-Sensitized Solar Cells Using a Mixture of Gold Nanocrystals



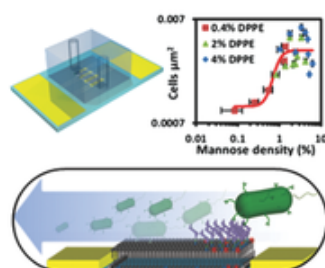
Gold medal! A mixture that contains appropriate proportions of SiO₂-coated Au nanospheres (AuNSs@SiO₂) and Au nanorods (AuNRs@SiO₂) is applied to enhance the sunlight utility of dye-sensitized solar cells.

[Full Paper]

Ye Zhang, Zhe Sun, Si Cheng, Feng Yan

ChemSusChem, March 08, 2016, DOI: 10.1002/cssc.201600110. [Read article](#)

A Microfluidic Device with Continuous Ligand Gradients in Supported Lipid Bilayers to Probe Effects of Ligand Surface Density and Solution Shear Stress on Pathogen Adhesion



A microfluidic device with continuous ligand gradients in locked-in supported

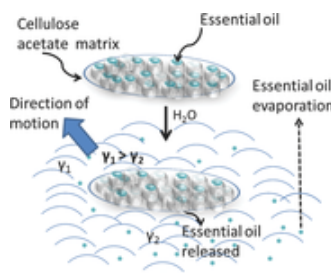
lipid bilayers (SLBs) is introduced for the first time. The power of microfluidics and locked-in SLBs is combined to enable one-pot analysis of ligand density and shear stress-dependent cell adhesion. To validate the platform, selective adhesion of uropathogenic *Escherichia coli* on continuous mannose gradients in SLBs is studied under different shear stresses.

[Full Paper]

Jasper van Weerd, Shrikrishnan Sankaran, Oliver Roling, Sertan Sukas, Sven Krabbenborg, Jurriaan Huskens, Séverine le Gac, Bart Jan Ravoo, Marcel Karperien, Pascal Jonkheijm

Adv. Mater. Interfaces, March 07, 2016, DOI: 10.1002/admi.201600055. [Read article](#)

Biomimetic Locomotion on Water of a Porous Natural Polymeric Composite

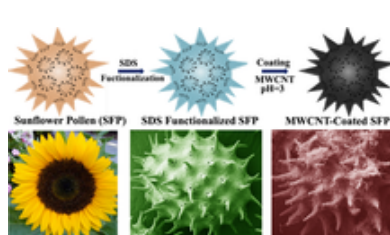


Essential oils are encapsulated into cellulose acetate and porous films with self-motor properties on air/water interface are created. The essential oil is slowly released on water leading to a surface tension gradient between the region in the vicinity of the film and away from it. This gradient can drive the motion for 3 h reaching velocities higher than 10 cm s^{-1} .

[Full Paper]

Ioannis L. Liakos, Pietro Salvagnini, Alice Scarpellini, Riccardo Carzino, Carlos Beltran, Elisa Mele, Vittorio Murino, Athanassia Athanassiou
Adv. Mater. Interfaces, March 04, 2016, DOI: 10.1002/admi.201500854. [Read article](#)

Preparation of Highly Monodisperse Electroactive Pollen Biocomposites

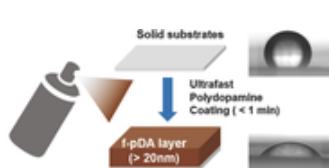


A monodisperse electroactive biocomposite based on natural pollen microcapsules is developed using hierarchical self-assembly that integrates surfactants and carbon nanotubes. The electrical properties of multiwalled carbon nanotube (MWCNT)-coated sunflower pollen (SFP) offer great potential to develop highly functional materials for electronics and optical applications.

[Communication]

Jeongeun Seo, Lili Wang, WeiBeng Ng, Nam-Joon Cho
ChemNanoMat, March 03, 2016, DOI: 10.1002/cnma.201600004. [Read article](#)

Sprayable Ultrafast Polydopamine Surface Modifications



Significant acceleration in the speed of polydopamine coating is achieved by optimizing various physicochemical conditions. Using these conditions, sufficient amounts of polydopamine layers are deposited onto various surfaces within a minute. Moreover, the coating process is improved by combining it with a spray system, which allows the system to be used for large-scale surface modifications.

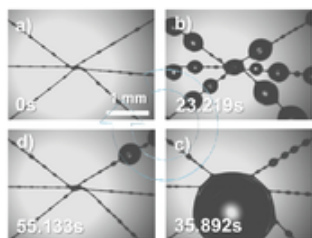
[Communication]

Sang Hyeon Hong, Seonki Hong, Myung-Hyun Ryou, Jang Wook Choi, Sung Min Kang,

Haeshin Lee

Adv. Mater. Interfaces, March 01, 2016, DOI: 10.1002/admi.201500857. [Read article](#)

Highly Efficient Fog Collection Unit by Integrating Artificial Spider Silks



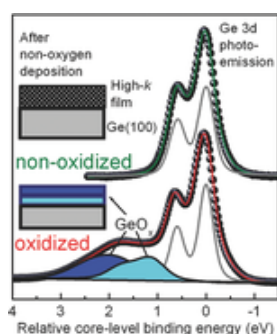
High Efficiency Water Collection System

A highly efficient fog collection unit is fabricated by integrating artificial spider silks. The fog collection efficiency of this unit increases first and then decreases after reaching a summit with the increase of the angles between adjacent artificial spider silks. Compared with similar units consisting of smooth fibers, this unit has a much higher fog collection efficiency, especially when the air is not very humid.

[Communication]

Hua Dong, Yongmei Zheng, Nü Wang, Hao Bai, Li Wang, Jing Wu, Yong Zhao, Lei Jiang
Adv. Mater. Interfaces, March 01, 2016, DOI: 10.1002/admi.201500831. [Read article](#)

Toward the Atomically Abrupt Interfaces of SiO_x /Semiconductor Junctions



A novel simple method to produce a high-quality interface between semiconductor (e.g., Ge or III-V) and dielectric film (i.e., SiO_2) is suggested. A nonoxygen element is deposited directly on an oxidized substrate at $T \geq 300 \text{ }^\circ\text{C}$, leading to semiconductor reduction and dielectric film growth. As a result, the formed interface is atomically abrupt and has a low density of defect gap states.

[Communication]

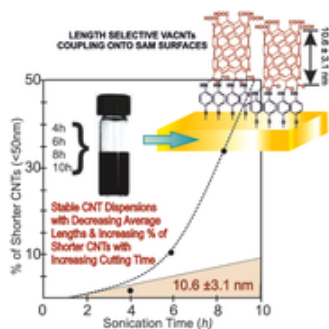
Mikhail Kuzmin, Pekka Laukkanen, Jaakko Mäkelä, Muhammad Yasir, Marjukka Tuominen, Johnny Dahl, Marko P. J. Punkkinen, Kalevi Kokko, Hannu-Pekka Hedman, Jongyun Moon, Risto Punkkinen, Mika Lastusaari, Ville Polojärvi, Ville-Markus Korpijärvi, Mircea Guina
Adv. Mater. Interfaces, March 01, 2016, DOI: 10.1002/admi.201500510. [Read article](#)

Length-Selective Chemical Assembly of Vertically Aligned Carbon Nanotubes

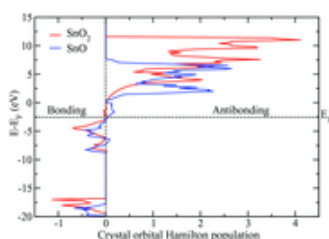
It is demonstrated for the first time that functionalized surfaces can control the assembly of short carbon nanotubes (CNTs) ($\approx 10 \text{ nm}$). The present studies also provide new mechanistic insights into the length-selective process that occurs upon chemical assembly and highlights that the length-selective process is not only driven by the diffusion mechanisms but also governed by the interactions between the CNTs and the chemically functionalized surfaces.

[Full Paper]

Zarrar Hussein, Frankie J. Rawson, Pola G. Oppenheimer, Aaron Acton, Paula M. Mendes
Adv. Mater. Interfaces, February 29, 2016, DOI: 10.1002/admi.201500860. [Read article](#)



Formation of Metallic States between Insulating SnO and SnO₂

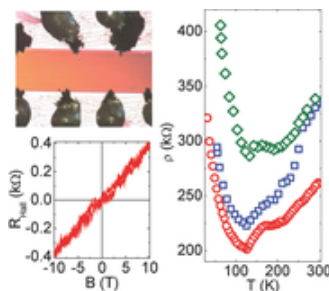


In this paper, stoichiometric SnO/SnO₂ interfaces are investigated by density functional theory. Although both component oxides are semiconductors, it is demonstrated that metallic states are formed at the interface and the mechanisms behind this observation are clarified. The metallic interface dopes the SnO and SnO₂ grains with delocalized carriers, which contribute to the conductivity of the grains, besides intrinsic defects.

[Communication]

Arwa Albar, Zhenwei Wang, Husam Niman Alshareef, Udo Schwingenschlög
Adv. Mater. Interfaces, February 25, 2016, DOI: 10.1002/admi.201500334. [Read article](#)

Charge Transfer, Band-Like Transport, and Magnetic Ions at F₁₆CoPc/Rubrene Interfaces

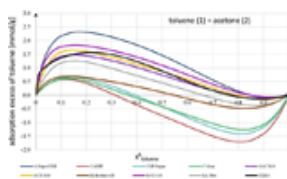


Here, the first organic interface is presented that combines band-like transport and the presence of magnetic ions. The charge transfer that leads to the large electrical conductivity fully involves the metal ions of the phthalocyanine molecules.

[Communication]

Yulia Krupskaya, Florian Rückerl, Martin Knupfer, Alberto F. Morpurgo
Adv. Mater. Interfaces, February 22, 2016, DOI: 10.1002/admi.201500863. [Read article](#)

Chemical Surface Characterization of Activated Carbons by Adsorption Excess of Probe Molecules

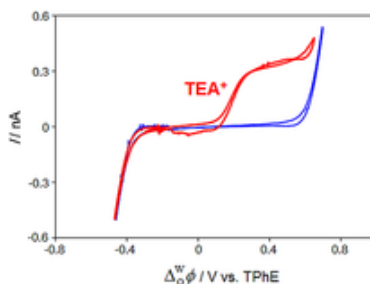


The surface chemistry of activated carbons was modeled by aromatic, polar, and nonpolar functional groups. The amounts of these surface groups were calculated from excess adsorption isotherms of probe molecules with aromatic, polar, and nonpolar characteristics. This is a basis to simulate liquid-phase adsorption on activated carbons by thermodynamic methods.

[Research Article]

Julian Treese, Christoph Pasel, Michael Luckas, Dieter Bathen
Chem. Eng. Technol., February 19, 2016, DOI: 10.1002/ceat.201500571. [Read article.](#)

Voltammetry of Ion Transfer at a Water-Toluene Micro-Interface



Crossing the border: Voltammograms of ion transfer at the water|toluene interface are successfully recorded for the first time by using a micro-interface electrolytic cell. The potential window at the water|toluene interface is larger than that at the water|1,2-dichloroethane interface, and the ion-transfer reactions across the water|toluene interface are found to be reversible.

[Communication]

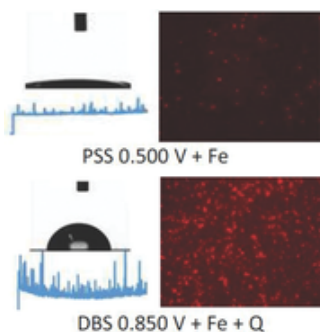
Megumi Kasuno, Yuki Matsuyama, Misaki Iijima
ChemElectroChem, February 17, 2016, DOI: 10.1002/celec.201500568. [Read article](#)

Tuning the Surface Properties of Polypyrrole Films for Modulating Bacterial Adhesion

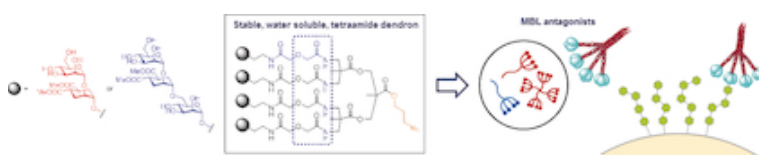
Polypyrrole (PPy) is electrochemically synthesized under various conditions with different types of dopants to tune the surface properties of the film including roughness and hydrophobicity. The polymer surface properties show a significant effect on the bacterial adhesion to the surface. The results may guide choosing suitable polymer synthesis conditions to yield PPy with suitable surface properties for the intended application.

[Full Paper]

Mohsen Golabi, Anthony P. F. Turner, Edwin W. H. Jager



Scaffold Optimisation of Tetravalent Antagonists of the Mannose Binding Lectin



Novel dendrons for multipresentation:

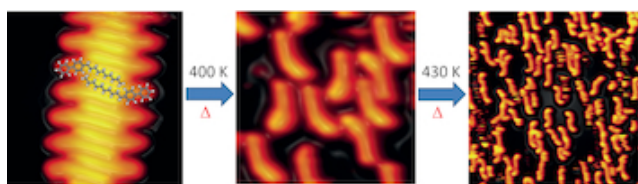
Water soluble, tetravalent glycodendrons that perform as powerful mannose-binding-lectin (MBL) antagonists are described. The stable scaffold adopted is a versatile tool for nested-layer multipresentation, which enabled the preparation of higher valency antagonists. All the constructs were tested as MBL-C

antagonist by a surface-plasmon-resonance assay and showed binding with IC_{50} values in the low micromolar range.

[Communication]

Giulio Goti, Alessandro Palmioli, Matteo Stravalaci, Sara Sattin, Maria-Grazia De Simoni, Marco Gobbi, Anna Bernardi
Chem. Eur. J., January 15, 2016, DOI: 10.1002/chem.201504388. [Read article](#).

Dehydrogenative Homocoupling of Alkyl Chains on Cu(110)



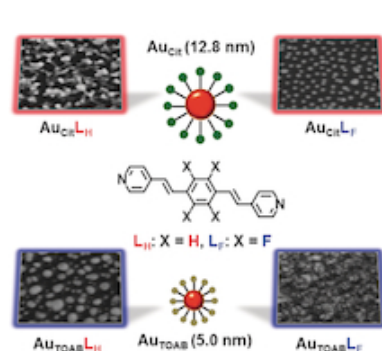
Chains linked: Through the interplay of high-resolution scanning tunneling microscopy imaging and density functional theory calculations, the stepwise homocoupling of alkyl chains on Cu(110) is demonstrated, proceeding from the intact chain, via the dehydrogenative intermediates, to the final coupling products.

[Communication]

Liangliang Cai, Qiang Sun, Chi Zhang, Yuanqi Ding, Wei Xu

Chem. Eur. J., January 8, 2016, DOI: 10.1002/chem.201504152. [Read article](#).

Gold Nanoparticle Assemblies on Surfaces: Reactivity Tuning through Capping-Layer and Cross-Linker Design



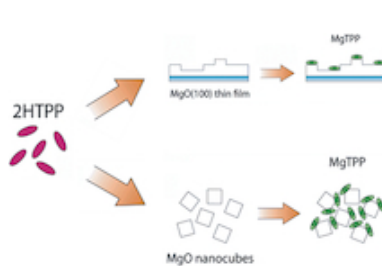
NPs@surfaces: Molecular cross-linkers direct the immobilization of two different gold nanoparticles (AuNPs) on different substrates. Aggregates and island-like films were obtained by using two electronically different cross-linkers and two types of AuNPs with hydrophilic or hydrophobic capping layers (see figure; Cit=citrate, TOAB=tetraoctylammonium bromide).

[Full Paper]

Sreejith Shankar, Meital Orbach, Revital Kaminker, Michal Lahav, Milko E. van der Boom

Chem. Eur. J., January 7, 2016, DOI: 10.1002/chem.201503297. [Read article](#).

Porphyrimetalation at MgO Surfaces: A Spectroscopic and Quantum Mechanical Study on Complementary Model Systems



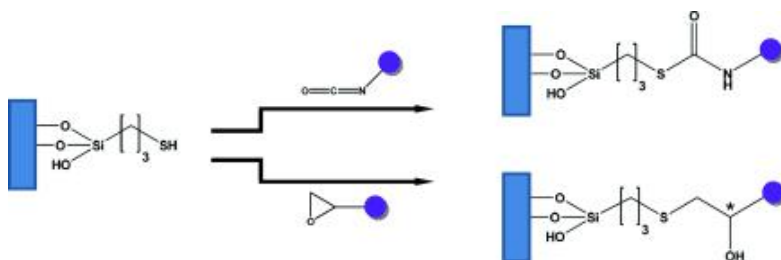
Porphyrimetalation swap shop: Spectroscopic adsorption studies on two complementary model systems, atomically clean thin MgO(100) films and MgO nanocube powders, show that low-coordinated surface cations located in corner, edge, or step regions of the MgO surfaces are subject to ion exchange between adsorbed porphyrimetalation molecules and the oxide surface.

[Full Paper]

Johannes Schneider, Matthias Franke, Martin Gurrath, Michael Röckert, Thomas Berger, Johannes Bernardi, Bernd Meyer, Hans-Peter Steinrück, Ole Lytken, Oliver Diwald

Chem. Eur. J., December 18, 2015, DOI: 10.1002/chem.201503661. [Read article](#).

A Modular Approach towards Mesoporous Silica Monoliths with Organically Modified Pore Walls: Nucleophilic Addition, Olefin Metathesis, and Cycloaddition

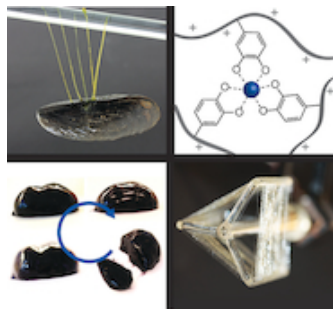


Mesoporous silica monoliths with defined surface chemistry were synthesized by a number of reactions: (i) coupling of an isocyanate to a surface-immobilized thiol, (ii) addition of an epoxide to a surface-immobilized thiol, (iii) cross-metathesis between two olefins, and (iv) Huisgen [2+3] cycloaddition of an alkyne-functionalized silica monolith with an azide.

[Full Paper]
Ronald Göbel, Marcus Stoltenberg, Stefan Krehl, Christine Biolley, Regina Rothe,

Bernd Schmidt, Peter Hesemann, Andreas Taubert
Eur. J. Inorg. Chem., November 13, 2015, DOI: 10.1002/ejic.201500638. [Read article](#).

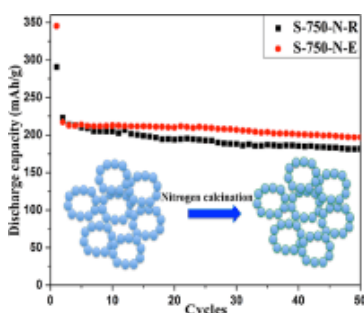
Mussel-Inspired Materials: Self-Healing through Coordination Chemistry



Inspired by nature: The ability of blue mussels and other marine creatures to attach to surfaces underwater and to make advanced materials have gained increasing awareness and interest amongst chemists. The combination of catechols and coordination chemistry to yield self-healing materials is the most recent sprout on this growing tree and is the focus of this Minireview.

[Minireview]
Marie Krogsgaard, Vicki Nue, Henrik Birkedal
Chem. Eur. J., November 12, 2015, DOI: 10.1002/chem.201503380. [Read article](#).

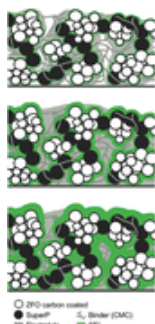
Synthesis of Nanoporous $\text{Li}_4\text{Ti}_5\text{O}_{12}$ - TiO_2 Composites for High-Performance Lithium-Ion-Battery Anodes



LIB it up: Homogeneous $\text{Li}_4\text{Ti}_5\text{O}_{12}$ - TiO_2 nanoporous composites can be easily fabricated through a nitrogen calcination process. The prepared samples (S-750-N) exhibit high capacity as well as good cycling stability when tested both at room temperature and 55 °C, which provides a novel method for the synthesis of composites used in relevant fields.

[Article]
Wei Zhang, Zhongyi Liu, Xingcheng Xiao, Dawei Liu
CHEMELECTROCHEM, August 12, 2015, DOI: 10.1002/celc.201500299. [Read article](#)

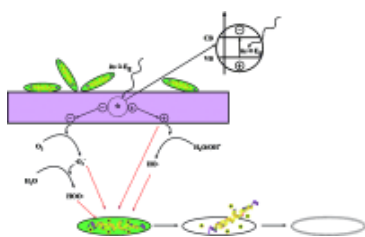
SEI Growth and Depth Profiling on ZFO Electrodes by Soft X-Ray Absorption Spectroscopy



The evolution of the solid electrolyte interface (SEI) in carbon-coated ZnFe_2O_4 (ZFO-C) anodes is studied by soft X-ray absorption spectroscopy (XAS). Experiments probe locally the SEI growth in the 2–100 nm range, using both total electron (TEY) and total fluorescence (TFY) yield techniques. XAS analysis shows that the SEI grows preferentially around the ZFO-C nanoparticles.

[Communication]
Andrea Di Cicco, Angelo Giglia, Roberto Gunnella, Stephan L. Koch, Franziska Mueller, Francesco Nobili, Marta Pasqualini, Stefano Passerini, Roberto Tossici, Agnieszka Witkowska
Adv. Energy Mater., July 03, 2015, DOI: 10.1002/aenm.201500642. [Read article](#)

$\text{Bi}_5\text{O}_7\text{I}$ Nanobelts: Synthesis, Modification, and Photocatalytic Antifouling Activity



Keeping it clean: A crystal growth mechanism of $\text{Bi}_5\text{O}_7\text{I}$ nanobelts is proposed. The modified $\text{Bi}_5\text{O}_7\text{I}$ composites show excellent degradation activity of malachite green and bactericidal effects against *Pseudomonas aeruginosa*, which may be attributed to the higher charge carrier separation efficiency of these heterojunction structures (see figure).

[Full Paper]
Chaohong Liu, Dun Zhang
Chem. Eur. J., June 30, 2015, DOI: 10.1002/chem.201500383. [Read article](#).

