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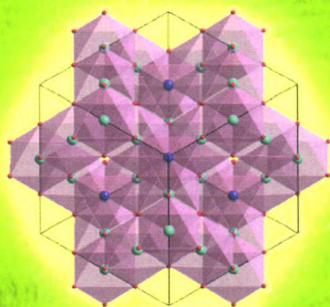
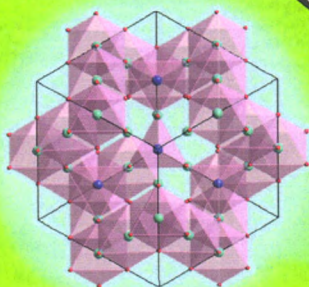
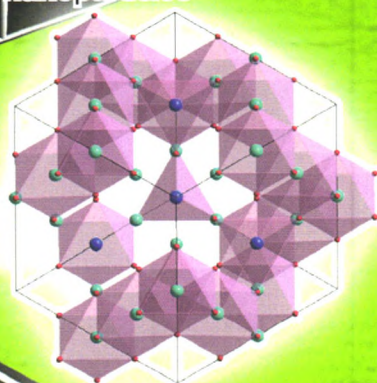


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Hydrogen evolution activity enhancement by tuning the oxygen vacancies in self-supported mesoporous spinel oxide nanowire arrays

Unique role of non-mercapto groups in thiol-pinning-mediated Ag growth on Au nanoparticles

In situ atomic-scale analysis of Rayleigh instability in ultrathin gold nanowires



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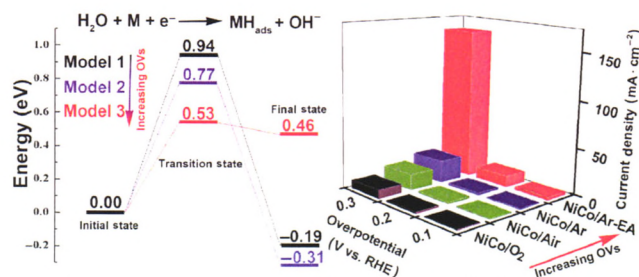
Hydrogen evolution activity enhancement by tuning the oxygen vacancies in self-supported mesoporous spinel oxide nanowire arrays

Dali Liu^{1,2}, Chao Zhang¹, Yifu Yu^{1,3}, Yanmei Shi¹, Yu Yu¹, Zhiqiang Niu³, and Bin Zhang^{1,2,3,*}

¹ Tianjin University, China

² Collaborative Innovation Center of Chemical Science and Engineering, China

³ Nankai University, China



This work opens a new avenue for the controlled generation of oxygen vacancies in mesoporous traditional metal oxides for efficient self-supported water reduction electrocatalysis.

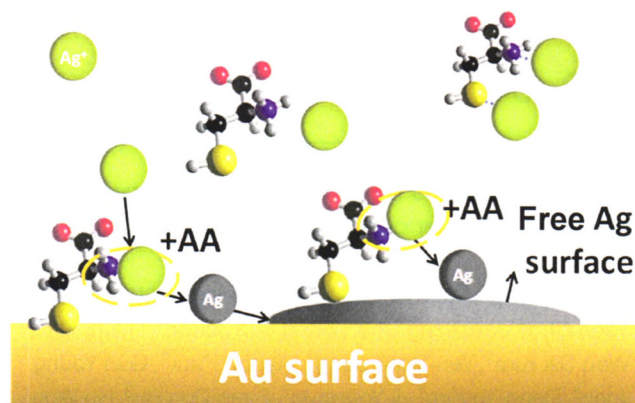
603–613

Unique role of non-mercapto groups in thiol-pinning-mediated Ag growth on Au nanoparticles

Jiaqi Chen^{1,2}, Jiao Yan^{1,2}, Yuandong Chen^{1,2}, Shuai Hou¹, Yinglu Ji¹, and Xiaochun Wu^{1,*}

¹ National Center for Nanoscience and Technology, China

² University of Chinese Academy of Sciences, China



Exposed $-\text{NH}_2(\text{NH}_3^+)$ groups from adsorbed cysteine can bind Ag^+ and subsequently accelerate Ag overgrowth on the Au surface.

614–624

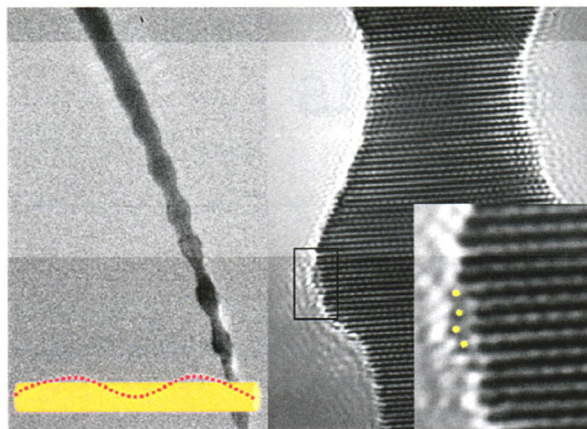
In situ atomic-scale analysis of Rayleigh instability in ultrathin gold nanowires

Shang Xu¹, Peifeng Li^{1,2}, and Yang Lu^{1,3,*}

¹ City University of Hong Kong, Hong Kong, China

² Zhejiang University, China

³ Hong Kong Branch of National Precious Metals Material Engineering Research Center (NPMR), Hong Kong, China



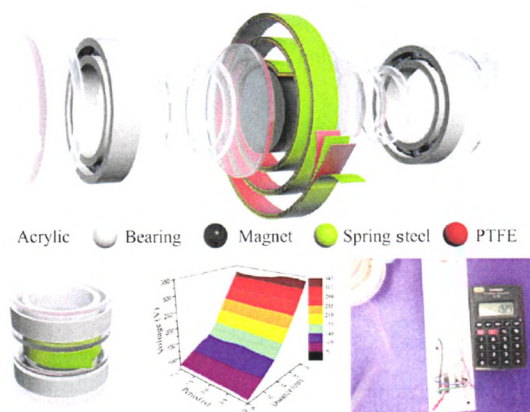
Rayleigh instability was observed in ultrathin gold nanowires upon moderate heating, which offers critical insights towards their reliable applications in nanoelectronics.

625–632

Triboelectric nanogenerator based on magnetically induced retractable spring steel tapes for efficient energy harvesting of large amplitude motion

Guanlin Liu, Jie Chen, Hengyu Guo, Meihui Lai, Xianjie Pu, Xue Wang, and Chenguo Hu*

Chongqing University, China



A magnetically induced retractable triboelectric nanogenerator that utilizes a magnet and spring steel tapes to efficiently harvest energy from large amplitude motion has been designed and fabricated.

633–641

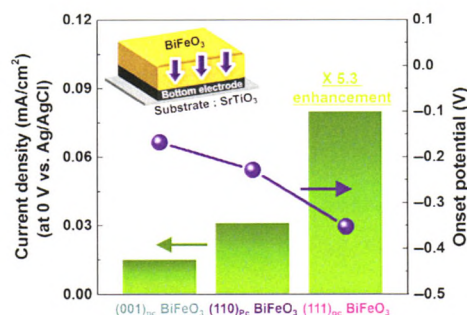
Domain-engineered BiFeO₃ thin-film photoanodes for highly enhanced ferroelectric solar water splitting

Jaesun Song¹, Taemin Ludvic Kim², Jongmin Lee¹, Sam Yeon Cho³, Jaeseong Cha¹, Sang Yun Jeong¹, Hyunji An¹, Wan Sik Kim¹, Yen-Sook Jung¹, Jiyoung Park¹, Gun Young Jung¹, Dong-Yu Kim¹, Ji Young Jo¹, Sang Don Bu³, Ho Won Jang^{2,*}, and Sanghan Lee^{1,*}

¹ Gwangju Institute of Science and Technology (GIST), Republic of Korea

² Seoul National University, Republic of Korea

³ Chonbuk National University, Republic of Korea



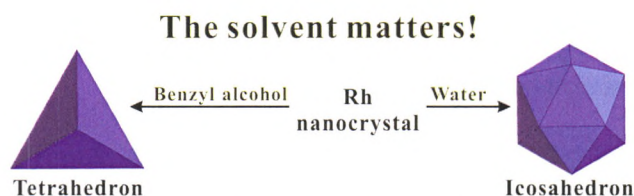
The photocatalytic properties of an epitaxial (111)_{pc} BiFeO₃ thin-film photoanode in the downward polarization state are greatly enhanced in comparison with those of (001)_{pc} and (110)_{pc} BiFeO₃ thin-film photoanodes. The significant improvement of the photocatalytic properties is provided by the enhanced ferroelectric domain switching of the mono-variant domain structure as well as the enhanced internal field afforded by higher spontaneous polarization.

642–655

Solvent-dependent evolution of cyclic penta-twinned rhodium icosahedral nanocrystals and their enhanced catalytic properties

Yanan Yang, Jiawei Zhang*, Yajing Wei, Qiaoli Chen, Zhenming Cao, Huiqi Li, Jiayu Chen, Jueli Shi, Zhaoxiong Xie*, and Lansun Zheng

Xiamen University, China



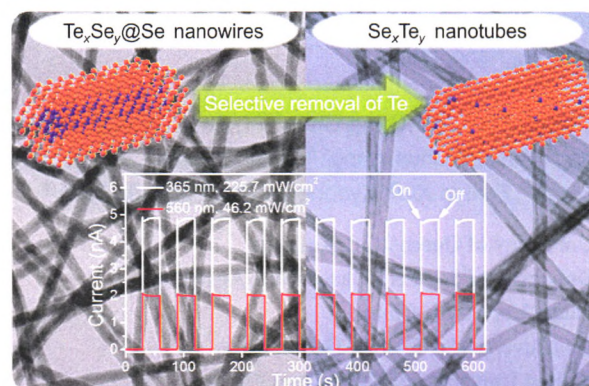
A transformation between cyclic penta-twinned and single-crystal Rh nanocrystals can be readily realized by changing the solvent. Cyclic penta-twinned Rh icosahedral nanocrystals show superior catalytic activity and stability during the electrooxidation of ethanol when compared to single-crystal tetrahedral Rh nanocrystals and commercial Rh black.

656–664

Selective oxidation mediated synthesis of unique Se_xTe_y nanotubes, their assembled thin films and photoconductivity

Yuan Yang, Guo-Qiang Liu, Min-Rui Gao, Yu Xia, and Shu-Hong Yu*

University of Science and Technology of China, China



A selective-oxidation approach was developed for synthesizing Se_xTe_y nanotubes with controlled inner and outer diameters from Te_xSe_y @Se core-shell nanowires. The nanotubes exhibited good photoconductivity over the whole ultraviolet-visible spectrum.

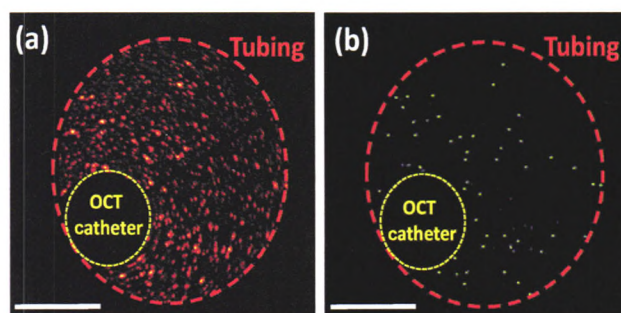
665–675

Gold nanoshells: Contrast agents for cell imaging by cardiovascular optical coherence tomography

Jie Hu¹, Francisco Sanz-Rodríguez^{1,2}, Fernando Rivero¹, Emma Martín Rodríguez^{1,2,*}, Río Aguilar Torres¹, Dirk H. Ortgies^{1,2}, José García Solé¹, Fernando Alfonso¹, and Daniel Jaque^{1,2}

¹ Universidad Autónoma de Madrid, Spain

² Hospital Ramón y Cajal, Spain



Optical coherence tomography was used to visualize individual cells for the first time and to discriminate between cells that internalized gold nanoparticles and those that did not, suggesting potential applications for the early diagnosis of atherosclerotic lesions.

676–685

Asymmetric growth of Au-core/Ag-shell nanorods with a strong octupolar plasmon resonance and an efficient second-harmonic generation

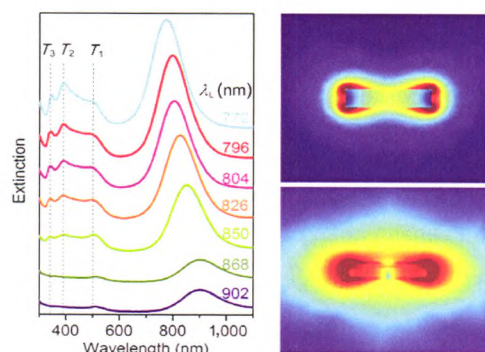
Sijing Ding^{1,2}, Dajie Yang¹, Xiaoli Liu³, Fan Nan¹, Ziqiang Cheng¹, Song-Jin Im⁴, Li Zhou¹, Jianfang Wang^{2,*}, and Ququan Wang^{1,*}

¹ Wuhan University, China

² The Chinese University of Hong Kong, Hong Kong, China

³ Qufu Normal University, China

⁴ Kim Il Sung University, Democratic People's Republic of Korea



A strong octupolar plasmon resonance and an efficient second-harmonic generation (SHG) are obtained for the first time by an asymmetric overgrowth of silver shells on gold nanorods. The SHG intensity of the Au–Ag nanorods with dual-frequency resonances is enhanced by 21 times compared to that of bare Au nanorods with only a longitudinal plasmon resonance.

686–695

Atomic disorders in layer structured topological insulator SnBi_2Te_4 nanoplates

Yi-Chao Zou¹, Zhi-Gang Chen^{1,2,*}, Enze Zhang³, Fantai Kong⁴, Yan Lu⁵, Lihua Wang^{1,5}, John Drennan¹, Zhongchang Wang^{6,7}, Faxian Xiu³, Kyeongjae Cho⁴, and Jin Zou^{1,*}

¹ University of Queensland, Australia

² University of Southern Queensland, Australia

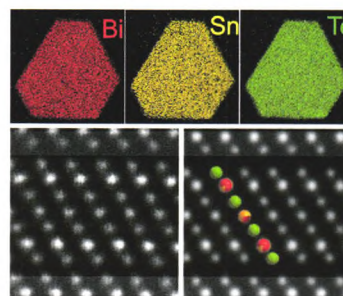
³ Fudan University, China

⁴ the University of Texas at Dallas, USA

⁵ Beijing University of Technology, China

⁶ Tohoku University, Japan

⁷ International Iberian Nanotechnology Laboratory, Portugal



Aberration-corrected scanning transmission electron microscopy investigations, quantitative image simulations, and density functional theory calculations for chemical vapor deposition grown SnBi_2Te_4 nanoplates show a recognizable amount of cation antisites, characterized by a low formation energy, and cause a reduced bandgap. Angle-dependent magnetoresistance measurements from nanoplate devices reveal a two-dimensional weak antilocalization effect associated with topological surface carriers, indicating that SnBi_2Te_4 nanostructures are promising candidates for spintronic and electronic applications.

696–706

Three-layer phosphorene-metal interfaces

Xiuying Zhang¹, Yuanyuan Pan¹, Meng Ye¹, Ruge Quhe², Yangyang Wang^{1,3}, Ying Guo⁴, Han Zhang¹, Yang Dan¹, Zhigang Song¹, Jingzhen Li¹, Jinbo Yang^{1,5}, Wanlin Guo⁶, and Jing Lu^{1,5,*}

¹ Peking University, China

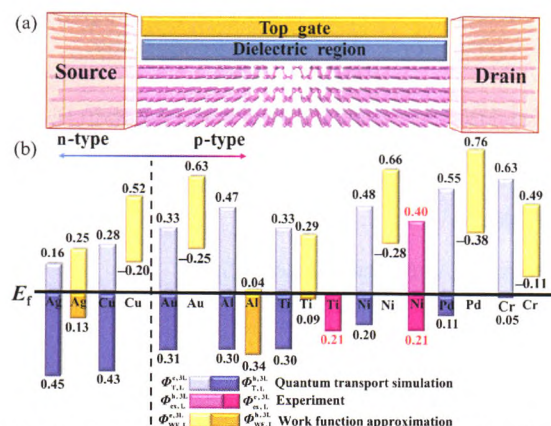
² Beijing University of Posts and Telecommunications, China

³ China Academy of Space Technology, China

⁴ Shaanxi Sci-Tech University, China

⁵ Collaborative Innovation Center of Quantum Matter, China

⁶ Nanjing University of Aeronautics and Astronautics, China



Schottky barriers in the three-layer phosphorene-metal interfaces are determined by *ab initio* quantum transport simulations, and the results agree with the experiments.

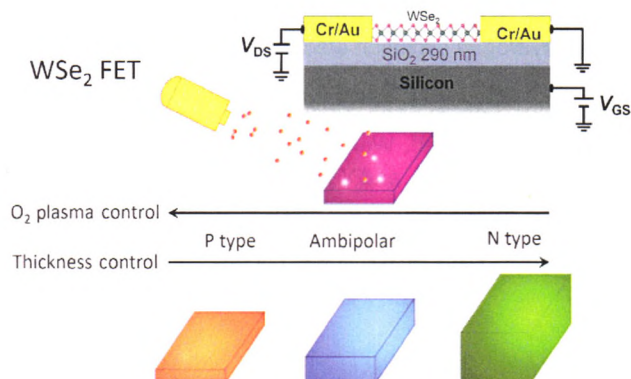
707–721

High-performance multilayer WSe₂ field-effect transistors with carrier type control

Pushpa Raj Pudasaini^{1,2}, Akinola Oyedele^{1,2}, Cheng Zhang^{1,2}, Michael G. Stanford¹, Nicholas Cross¹, Anthony T. Wong¹, Anna N. Hoffman¹, Kai Xiao², Gerd Duscher^{1,2}, David G. Mandrus^{1,2}, Thomas Z. Ward², and Philip D. Rack^{1,2,*}

¹ University of Tennessee, USA

² Oak Ridge National Laboratory, USA



High-performance few-layer WSe₂ field-effect transistor devices with carrier type control are demonstrated via thickness modulation and a remote oxygen plasma surface treatment.

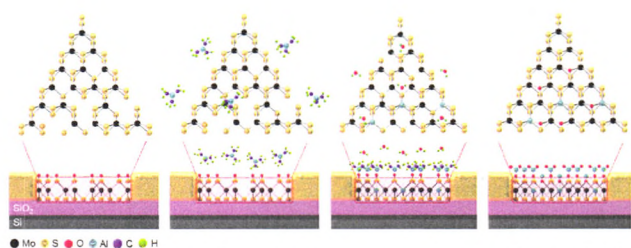
722–730

Enhanced electrical and optical properties of single-layered MoS₂ by incorporation of aluminum

Hyung-Jun Kim^{1,2}, Suk Yang^{1,2}, Hojoong Kim^{1,2}, Jin Young Moon², Kyung Park², Yun-Jin Park^{1,2}, and Jang-Yeon Kwon^{1,2,*}

¹ Yonsei University, Republic of Korea

² Yonsei Institute of Convergence Technology, Republic of Korea



We demonstrate the effect of Al incorporation through atomically deposited Al₂O₃ films on synthesized MoS₂ obtained using chemical vapor deposition (CVD), which significantly contributed to the enhanced performance of MoS₂ field-effect transistor (FET) devices.

731–740

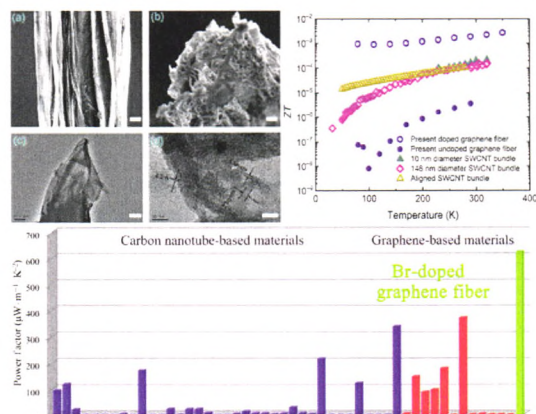
Chemically doped macroscopic graphene fibers with significantly enhanced thermoelectric properties

Weigang Ma¹, Yingjun Liu², Shen Yan¹, Tingting Miao³, Shaoyi Shi¹, Zhen Xu², Xing Zhang^{1,*}, and Chao Gao^{2,*}

¹ Tsinghua University, China

² Zhejiang University, China

³ China University of Petroleum-Beijing, China



In this study, bromine doping is reported to be an effective method to significantly enhance the thermoelectric properties of macroscopic graphene fibers. The maximum ZT is 2.76×10^{-3} , which is approximately four orders of magnitude larger than that of the undoped fibers; the room temperature power factor is shown to increase up to $624 \mu\text{W} \cdot \text{m}^{-1} \cdot \text{K}^{-2}$, which is higher than any other material solely composed of carbon nanotubes and graphene reported in the literature.

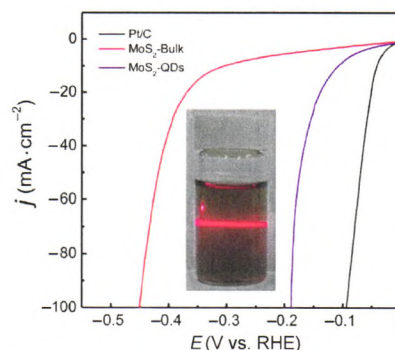
741–750

Defective molybdenum sulfide quantum dots as highly active hydrogen evolution electrocatalysts

Gang Ou¹, Peixun Fan¹, Xiaoxing Ke², Yushuai Xu¹, Kai Huang¹, Hehe Wei¹, Wen Yu¹, Hongjun Zhang¹, Minlin Zhong^{1,*}, Hui Wu^{1,*}, and Yadong Li¹

¹ Tsinghua University, China

² Beijing University of Technology, China



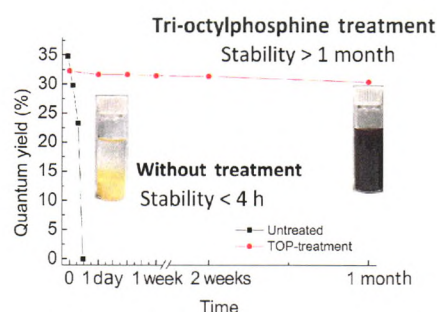
Defective molybdenum sulfide quantum dots synthesized by a facile and general ultrafast laser ablation method show highly enhanced activity and stability in the electrocatalytic hydrogen evolution reaction, owing to their very large surface area, defective structure, abundance of active sites, and high conductivity.

751–761

Enhanced stabilization of inorganic cesium lead triiodide (CsPbI₃) perovskite quantum dots with tri-octylphosphine

Chang Lu, Hui Li, Kathy Kolodziejski, Chaochao Dun, Wenxiao Huang, David Carroll, and Scott M. Geyer*

Wake Forest University, USA



Through the addition of tri-octylphosphine as part of the post-synthesis treatment, we significantly enhance the stability of CsPbI₃ quantum dots, from hours to months. This method helps to resolve the intrinsic instability issue of triiodide perovskite materials and devices.

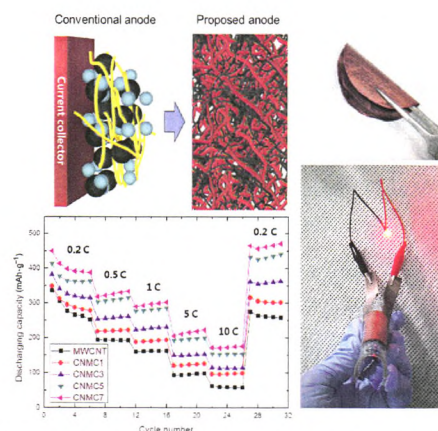
762–768

Copper nanowire/multi-walled carbon nanotube composites as all-nanowire flexible electrode for fast-charging/discharging lithium-ion battery

Zhenxing Yin¹, Sanghun Cho¹, Duck-Jae You¹, Yong-keon Ahn¹, Jeeyoung Yoo^{1,*}, and Youn Sang Kim^{1,2,*}

¹ Seoul National University, Republic of Korea

² Advanced Institutes of Convergence Technology, Republic of Korea



A novel lightweight three-dimensional composite anode was fabricated using entirely one-dimensional nanomaterials, i.e., Cu nanowires (CuNWs) and multi-walled carbon nanotubes (MWCNTs). Half-cell and full-cell Li-ion batteries (LIBs) employing this composite anode exhibited high specific capacities and Coulombic efficiencies even at a high current density. More importantly, for the first time we overcame the limitations of MWCNTs as anode materials for fast-charging/discharging half-cell and full-cell LIBs by employing CuNWs, and the resulting anode can be applied to flexible LIBs.

769–779

Construction of Pd-M (M = Ni, Ag, Cu) alloy surfaces for catalytic applications

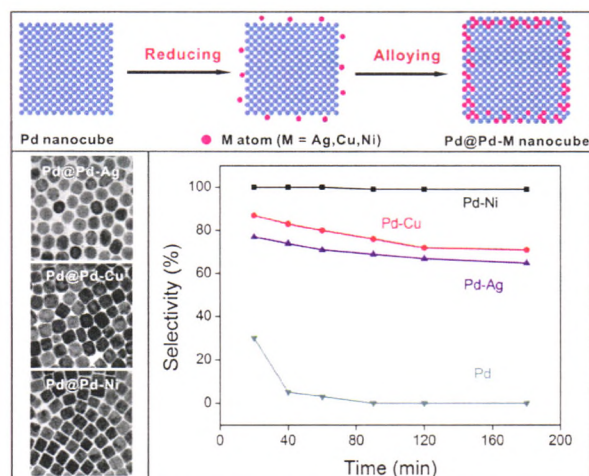
Xiang Li¹, Xixi Wang¹, Maochang Liu¹, Hongyang Liu², Qiang Chen^{1,3,*}, Yadong Yin⁴, and Mingshang Jin^{1,*}

¹ Xi'an Jiaotong University, China

² Institute of Metal Research, Chinese Academy of Sciences, China

³ Beijing University of Chemical Technology, China

⁴ University of California, Riverside, USA



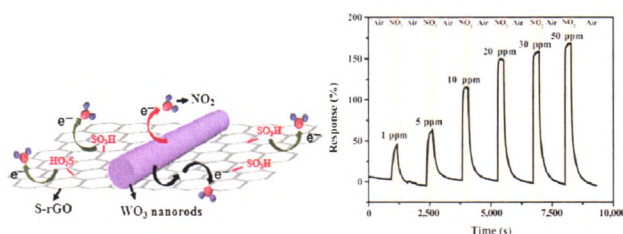
Through the approach described in this work, second-metal elements can be alloyed into the surface of Pd nanocrystals directly to modify the catalytic performances of Pd nanocrystals.

780–790

Highly sensitive and rapidly responding room-temperature NO₂ gas sensors based on WO₃ nanorods/sulfonated graphene nanocomposites

Tingting Wang, Juanyuan Hao*, Shengliang Zheng, Quan Sun, Di Zhang, and You Wang*

Harbin Institute of Technology, China



In this study, a highly sensitive and rapidly responding room-temperature NO₂ gas sensor based on WO₃ nanorods/sulfonated reduced graphene oxide (S-rGO) was developed using a simple and cost-effective hydrothermal method.

791–803

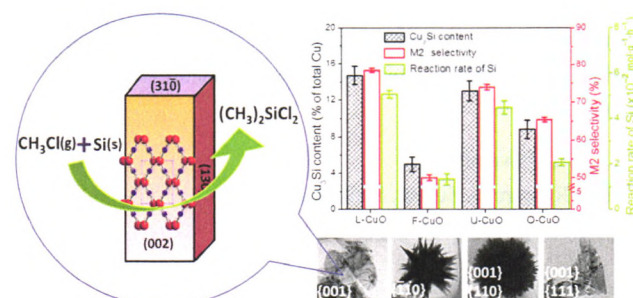
Morphology-dependent catalytic properties of nanocupric oxides in the Rochow reaction

Yu Zhang^{1,2}, Yongjun Ji^{1,*}, Jing Li^{1,2}, Hezhi Liu¹, Xiao Hu³, Ziyi Zhong³, and Fabing Su¹

¹ Institute of Process Engineering, Chinese Academy of Sciences, China

² University of Chinese Academy of Sciences, China

³ Nanyang Technological University, Singapore



Leaf-like CuO that mainly exposes the {001} crystal plane showed superior catalytic properties for dimethyldichlorosilane synthesis via the Rochow reaction owing to the maximum formation of the Cu₃Si alloy phase generated in the reacted region of the Si surface.

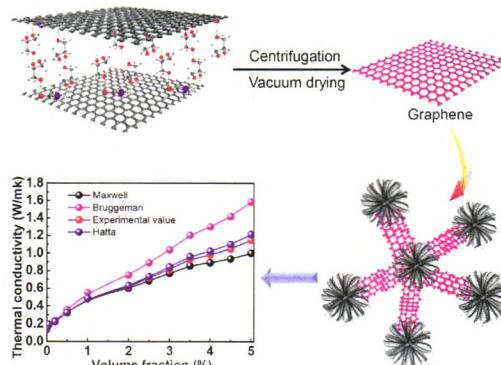
804–819

Facile preparation of pristine graphene using urea/glycerol as efficient stripping agents

Jianping Chen^{1,2}, Weili Shi¹, Zhaodongfang Gao¹, Tao Wang¹, Shan Wang¹, Lijie Dong¹, Quanling Yang^{1,*}, and Chuanxi Xiong^{1,*}

¹ Wuhan University of Technology, China

² Henan University, China



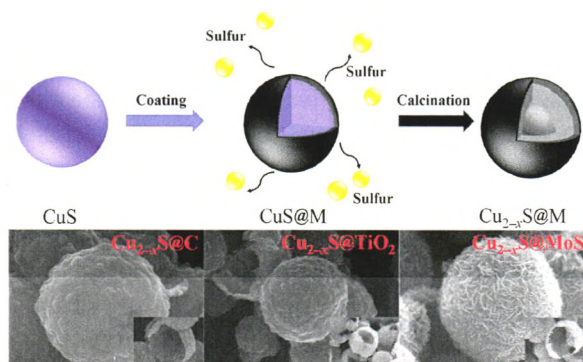
Natural graphite is exfoliated to produce large-size and few-layer graphene sheets in urea/glycerol solution via a simple mechanical stirring method. The incorporation of only a small amount of the as-prepared graphene films into polyvinylidene fluoride leads to a high increase in thermal conductivity.

820–830

Self-templating thermolysis synthesis of $\text{Cu}_{2-x}\text{S}@M$ ($M = \text{C}, \text{TiO}_2, \text{MoS}_2$) hollow spheres and their application in rechargeable lithium batteries

Yunhui Wang, He Li, Yiyong Zhang, Yueying Peng, Peng Zhang, and Jinbao Zhao*

Xiamen University, China



A self-templating thermolysis strategy is employed to prepare different $\text{Cu}_{2-x}\text{S}@M$ ($M = \text{C}, \text{TiO}_2, \text{MoS}_2$) hollow structures. All composites are assembled as electrodes and tested in lithium batteries, showing excellent electrochemical performances.

831–844

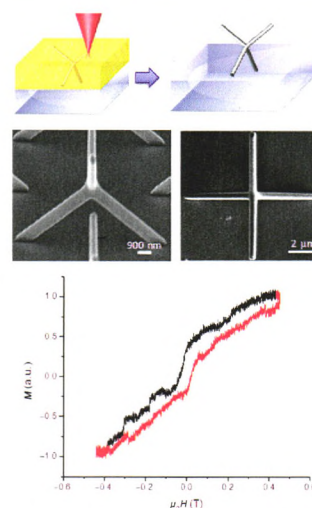
Two-photon lithography for 3D magnetic nanostructure fabrication

Gwilym Williams¹, Matthew Hunt¹, Benedikt Boehm², Andrew May¹, Michael Taverne³, Daniel Ho³, Sean Giblin¹, Dan Read¹, John Rarity³, Rolf Allenspach², and Sam Ladak^{1,*}

¹ Cardiff University, UK

² IBM Research - Zurich, Switzerland

³ University of Bristol, UK



A combination of two-photon lithography and electrochemical deposition is utilized to fabricate three-dimensional magnetic nanostructures. Magnetometry and magnetic imaging show evidence of domain wall pinning at the three-dimensional (3D) nanostructured junction.

845–854

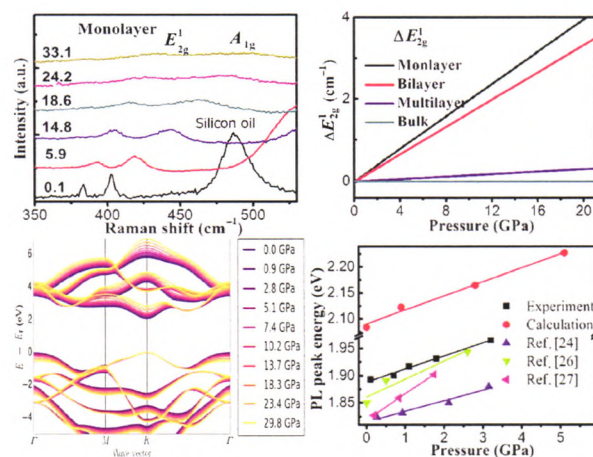
Thickness-dependent phase transition and optical behavior of MoS₂ films under high pressure

Xuerui Cheng¹, Yuanyuan Li², Jimin Shang¹, Chuansheng Hu², Yufen Ren¹, Miao Liu^{3,*}, and Zeming Qi^{2,*}

¹ Zhengzhou University of Light Industry, China

² University of Science and Technology of China, China

³ Lawrence Berkeley National Laboratory, USA



The structure and optical properties of layered MoS₂ can be effectively modified by pressure. The Raman and photoluminescence spectra of MoS₂ with different thicknesses show distinct pressure dependencies.

855–863

Atomic and electronic structure of Si dangling bonds in quasi-free-standing monolayer graphene

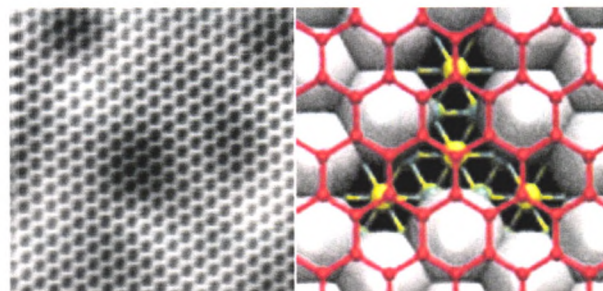
Yuya Murata¹, Tommaso Cavallucci¹, Valentina Tozzini¹, Niko Pavlić², Leo Gross², Gerhard Meyer², Makoto Takamura³, Hiroki Hibino^{3,†}, Fabio Beltram¹, and Stefan Heun^{1,*}

¹ Istituto Nanoscienze-CNR and Scuola Normale Superiore, Italy

² IBM Research - Zurich, Switzerland

³ NTT Basic Research Laboratories, Japan

[†] Present address: Kwansei Gakuin University, Japan



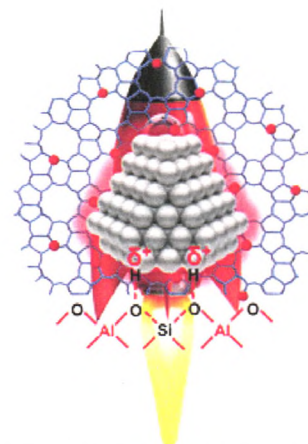
The structural and electronic properties of defects in quasi-free-standing monolayer graphene (QFMLG) were studied by low-temperature scanning tunneling microscopy/spectroscopy and atomic force microscopy. The comparison of the experimental results with density functional theory calculations indicates that the defects consist of clusters of Si dangling bonds. The results of the present work provide the basis for a rational design of high-mobility QFMLG.

864–873

Mesoporous H-ZSM-5 nanocrystals with programmable number of acid sites as “solid ligands” to activate Pd nanoparticles for C–C coupling reactions

Wenyu Ke, Tianlu Cui, Qiuying Yu, Mengying Wang, Libing Lv, Honghui Wang, Zhidong Jiang, Xinhao Li*, and Jiasheng Chen*

Shanghai Jiao Tong University, China



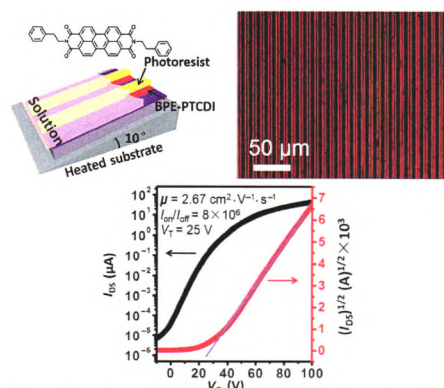
Mesoporous H-ZSM-5 nanocrystals with a significant number of acid sites can function as “solid ligands” to activate the embedded Pd nanoparticles for C–C coupling reactions.

874–881

High-mobility air-stable n-type field-effect transistors based on large-area solution-processed organic single-crystal arrays

Liang Wang, Xiujuan Zhang, Gaole Dai, Wei Deng, Jiansheng Jie*, and Xiaohong Zhang

Soochow University, China



A simple and efficient solution-processed approach is provided for achieving the growth of large-area highly aligned n-type single-crystalline organic submicron ribbon arrays. N-channel organic field-effect transistors (n-FETs) fabricated based on the submicron ribbon arrays exhibit a high electron mobility of $2.67 \text{ cm}^2 \cdot \text{V}^{-1} \cdot \text{s}^{-1}$ as well as robust air stability for over 50 days.

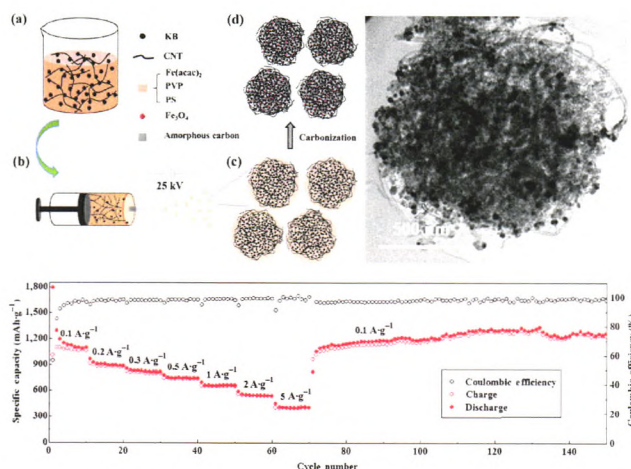
882–891

Electrosprayed porous Fe_3O_4 /carbon microspheres as anode materials for high-performance lithium-ion batteries

Wenjie Han¹, Xianying Qin^{1,2,*}, Junxiong Wu², Qing Li¹, Ming Liu¹, Yue Xia¹, Hongda Du¹, Baohua Li^{1,*}, and Feiyu Kang¹

¹ Tsinghua University, China

² The Hong Kong University of Science and Technology, Hong Kong, China



Porous Fe_3O_4 /carbon microspheres (PFCMs) are successfully fabricated via a facile electrospay method and subsequent heat treatment. As anode materials for Li-ion batteries, PFCMs deliver a high capacity, long cycling life, and outstanding rate performance due to the hybrid, porous, and conductive structure.

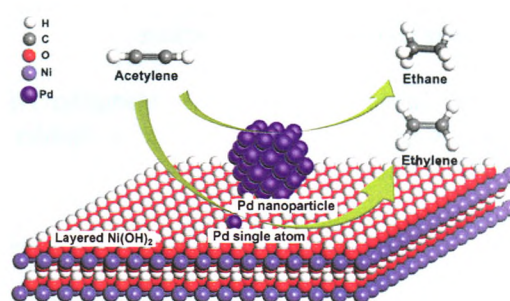
892–904

50 ppm of Pd dispersed on $\text{Ni}(\text{OH})_2$ nanosheets catalyzing semi-hydrogenation of acetylene with high activity and selectivity

Mingzhen Hu¹, Jian Zhang², Wei Zhu², Zheng Chen², Xin Gao², Xianjun Du², Jiawei Wan², Kebin Zhou^{1,*}, Chen Chen^{2,*}, and Yadong Li²

¹ University of Chinese Academy of Sciences, China

² Tsinghua University, China



A Pd/ $\text{Ni}(\text{OH})_2$ catalyst with an ultra-low (0.005%) Pd loading was found to exhibit superior catalytic properties to the corresponding higher Pd-loaded nanoparticle catalyst in the selective hydrogenation of acetylene to ethylene, due to the atomically dispersed nature of the Pd sites in the 0.005% Pd/ $\text{Ni}(\text{OH})_2$ catalyst and the supporting effect of the abundant hydroxyl groups of $\text{Ni}(\text{OH})_2$.

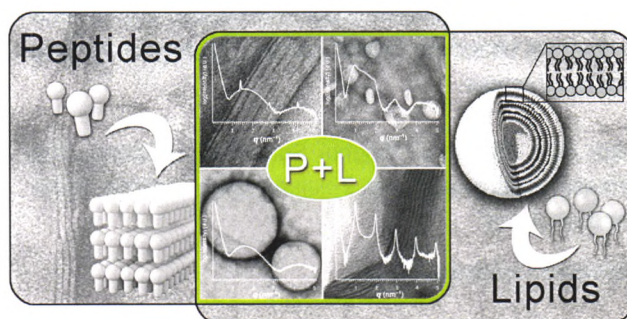
905–912

Peptide self-assembly into lamellar phases and the formation of lipid-peptide nanostructures

Karin Kornmueller¹, Bernhard Lehofer¹, Gerd Leitinger¹, Heinz Amenitsch², and Ruth Prassl^{1,*}

¹ Medical University of Graz, Austria

² Graz University of Technology, Austria



Systematically varied amphiphilic designer peptides can mimic lipid lamellar phases and self-assemble into a variety of nanostructures (tubes, vesicles, bicelles) when mixed with lipids.

913–928

Acid-degradable gadolinium-based nanoscale coordination polymer: A potential platform for targeted drug delivery and potential magnetic resonance imaging

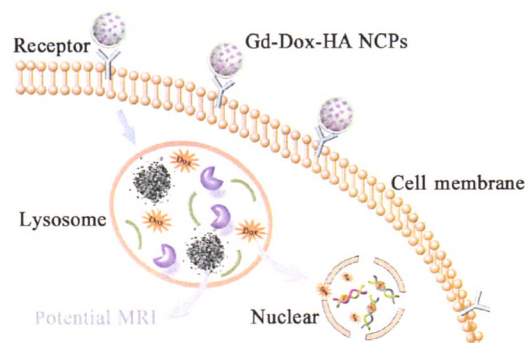
Zhimei He¹, Penghui Zhang^{1,2}, Yan Xiao¹, Jingjing Li³, Fang Yang⁴, Yang Liu⁴, Jian-Rong Zhang^{1,*}, and Jun-Jie Zhu^{1,*}

¹ Nanjing University, China

² Xi'an Jiaotong University, China

³ Xuzhou Medical University, China

⁴ Southeast University, China



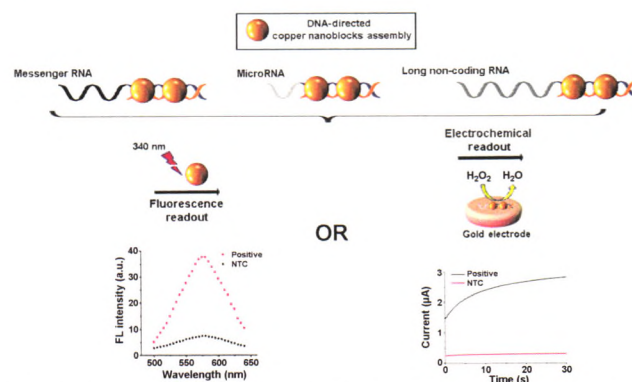
A precision-guided “depth bomb” for cancer cells was constructed by decorating a doxorubicin-loaded nanoscale coordination polymer with a hyaluronic acid shell. Once selectively internalized into targeted cancer cells, the nano-bomb was triggered within the acidic lysosomes and collapsed into fragments, accompanied by rapid drug release and fluorescence restoration of the drug.

929–939

DNA-directed assembly of copper nanoblocks with inbuilt fluorescent and electrochemical properties: Application in simultaneous amplification-free analysis of multiple RNA species

Kevin M. Koo, Laura G. Carrascosa, and Matt Trau^{*}

The University of Queensland, Australia



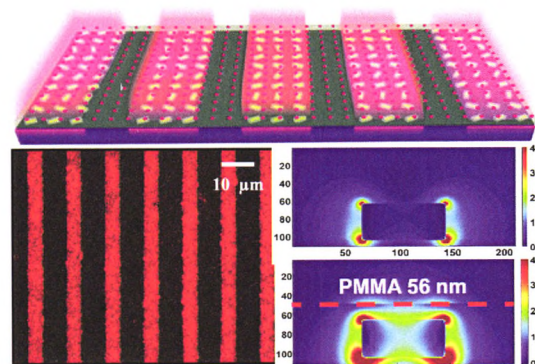
We developed a nanosensor that uses DNA-templated copper nanoblock synthesis for universal detection of different RNA species. We exploited the fluorescent and electrochemical properties of the synthesized copper nanoblocks to achieve simultaneous amplification-free detection of messenger RNA, microRNA, and long non-coding RNA cancer biomarkers.

940–952

Uniform and reproducible plasmon-enhanced fluorescence substrate based on PMMA-coated, large-area Au@Ag nanorod arrays

Jun Sun, Ziyang Li, Yinghui Sun, Liubiao Zhong, Jing Huang, Junchang Zhang, Zhiqiang Liang, Jianmei Chen, and Lin Jiang*

Soochow University, China



A simple and scalable method was developed based on poly(methyl methacrylate) (PMMA)-coated Au@Ag nanorod arrays to fabricate reproducibly large-area and uniform metal-enhanced fluorescence (MEF) substrates.

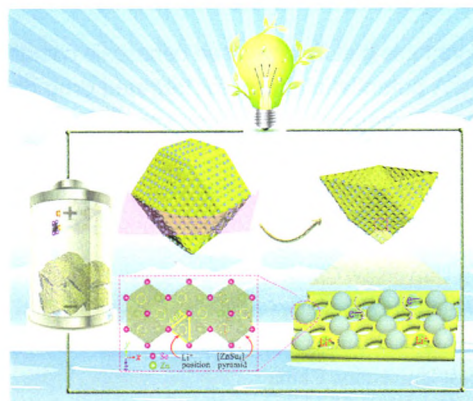
953–965

Embedding ZnSe nanodots in nitrogen-doped hollow carbon architectures for superior lithium storage

Ziliang Chen¹, Renbing Wu^{1,*}, Hao Wang¹, Kelvin H. L. Zhang², Yun Song¹, Feilong Wu¹, Fang Fang¹, and Dalin Sun^{1,*}

¹ Fudan University, China

² Xiamen University, China



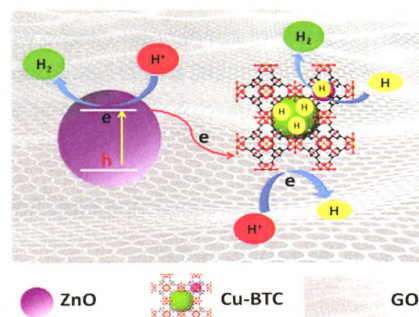
Three-dimensional hybrid hollow composites with ultrafine zinc selenide nanodots uniformly confined within a N-doped porous carbon network have been rationally developed. Owing to their structural and compositional advantages, these architectures show exceptional lithium-storage performance, with an ultrahigh reversible specific capacity and excellent rate capability.

966–978

Photocatalytic H₂ evolution improvement for H free-radical stabilization by electrostatic interaction of a Cu-BTC MOF with ZnO/GO

Xifeng Shi, Jiahui Zhang, Guanwei Cui*, Ning Deng, Wen Wang, Qian Wang, and Bo Tang*

Shandong Normal University, China



Cu-benzene-1,3,5-tricarboxylate (BTC) metal-organic framework (MOF) was incorporated into the ZnO/graphene oxide (GO) photocatalytic system by an electrostatic interaction method to stabilize the H[•] radicals generated from a photoreduction reaction. In the proposed assembly structure, ZnO served as the photoelectron donor, and GO as the ZnO-to-Cu-BTC photoelectron-transfer channel and as the supporting matrix for ZnO and Cu-BTC. Cu-BTC was expected to serve as a microcontainer for the free radicals generated by light irradiation to extend their lifetime.

979–987

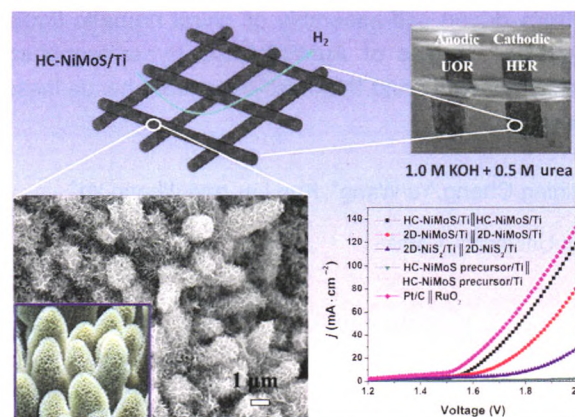
Hierarchical coral-like NiMoS nanohybrids as highly efficient bifunctional electrocatalysts for overall urea electrolysis

Xiaoxia Wang¹, Jianmei Wang³, Xuping Sun^{2,*}, Shuang Wei¹, Liang Cui¹, Wenrong Yang³, and Jingquan Liu^{1,*}

¹ Qingdao University, China

² Sichuan University, China

³ Deakin University, Australia



Hierarchical coral-like Ni-Mo sulfides on Ti mesh (HC-NiMoS/Ti) were prepared and utilized as effective bifunctional electrodes for highly efficient hydrogen generation from overall urea electrolysis.

988–996

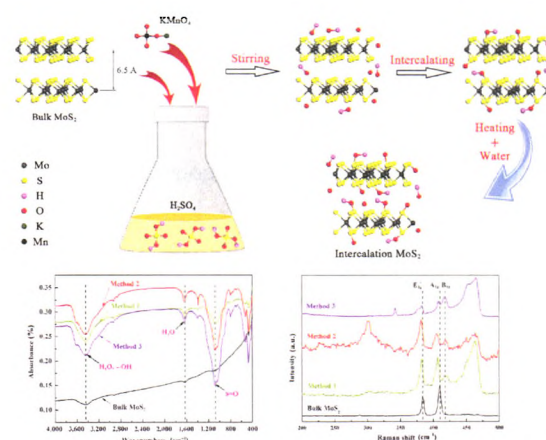
Oxidation layering mechanism of graphene-like MoS₂ prepared by the intercalation-detonation method

Fan Yang¹, Kuaishe Wang¹, Ping Hu^{1,2,*}, Zhenyu Chen¹, Jie Deng¹, Boliang Hu¹, Weicheng Cao², Dongxin Liu², Geng An², and Alex A. Volinsky³

¹ Xi'an University of Architecture and Technology, China

² Jinduicheng Molybdenum Co., Ltd., China

³ University of South Florida, USA



The oxidation layering mechanism of graphene-like MoS₂ is proposed. The intensity ratio of B_{1u} and A_{1g} peaks in the Raman spectra was determined to quantify the effect of oxidative intercalation.

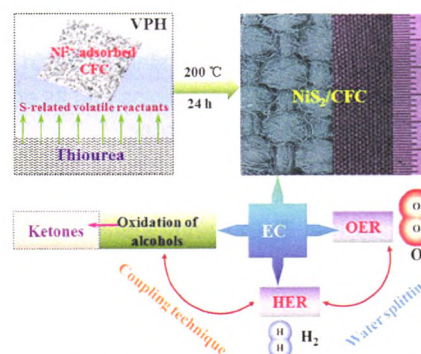
997–1003

Vapor-phase hydrothermal growth of single crystalline NiS₂ nanostructure film on carbon fiber cloth for electrocatalytic oxidation of alcohols to ketones and simultaneous H₂ evolution

Tianxing Wu¹, Xiaoguang Zhu¹, Guozhong Wang^{1,*}, Yunxia Zhang¹, Haimin Zhang^{1,*}, and Huijun Zhao^{1,2}

¹ Institute of Solid State Physics, Chinese Academy of Sciences, China

² Griffith University, Australia



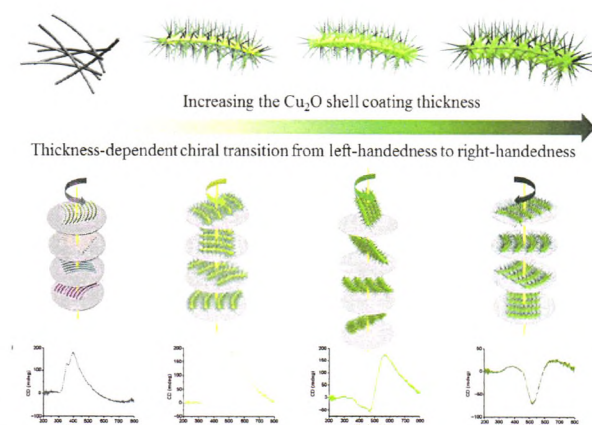
A vapor-phase hydrothermally grown NiS₂ nanostructure film supported on a carbon fiber cloth (NiS₂/CFC) as an electrode material exhibited superior dual electrocatalytic activities for oxygen and hydrogen evolution reactions (OER/HER) and efficiently promoted the electrocatalytic oxidation of alcohols to ketones with significantly decreased overpotentials as compared to that for the OER. This study presents a new energy conversion strategy combining high-value-added chemical production with highly efficient H₂ generation by water splitting.

1004–1017

Entropy-driven self-assembly of chiral nematic liquid crystalline phases of AgNR@Cu₂O hyper branched coaxial nanorods and thickness-dependent handedness transition

Guiqing Cheng, Yu Wang*, Kun Liu, and Jihong Yu*

Jilin University, China



The chiral transition of Ag nanorod (AgNR)@Cu₂O hyper branched coaxial nanorods (HBCNRs) liquid crystal can be achieved via increasing the thickness of Cu₂O coating.

1018–1028

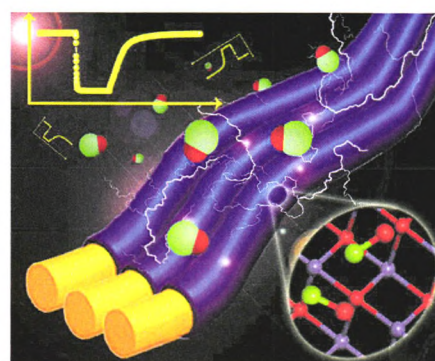
Highly sensitive hybrid nanofiber-based room-temperature CO sensors: Experiments and density functional theory simulations

Lili Wang¹, Ruiqing Chai^{2,3}, Zheng Lou^{2,*}, and Guozhen Shen^{2,3,*}

¹ Jilin University, China

² Institute of Semiconductors, Chinese Academy of Sciences, China

³ University of Chinese Academy of Sciences, China



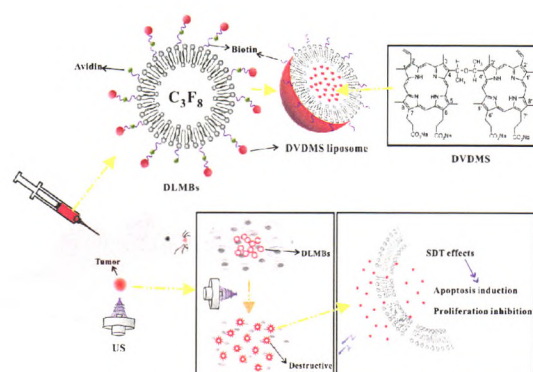
We present the fabrication of a novel sensing platform based on a hybrid structure with active facets. It showed high selectivity, high sensitivity, and ultrafast response at room temperature for the detection of CO; the results were further supported by density functional theory calculations. These findings highlight the potential of metal oxide semiconductors with high-energy facets as active components for electronic devices.

1029–1037

Ultrasound-triggered release of sinoporphyrin sodium from liposome-microbubble complexes and its enhanced sonodynamic toxicity in breast cancer

Yixiang Li, Huanxiao An, Xiaobing Wang, Pan Wang*, Fei Qu, Yan Jiao, Kun Zhang, and Quanhong Liu*

Shaanxi Normal University, China



The liposome-encapsulated hydrosoluble sonosensitizer sinoporphyrin sodium (DVDMS) was coupled with microbubbles via the biotin-avidin linkage to synthesize a complex (DLMBs) that exhibits high ultrasound response. Ultrasound-induced reactive oxygen species were key mediators to trigger the boosted release of DVDMS from DLMBs and improve the cellular uptake and intratumoral diffusion of DVDMS to achieve better sonodynamic effects against breast cancer.

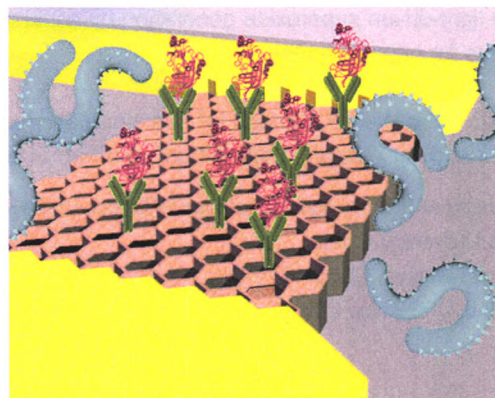
1038–1056

Ultrasensitive detection of Ebola matrix protein in a memristor mode

Bergoi Ibarlucea^{1,*}, Teuku Fawzul Akbar¹, Kihyun Kim², Taiuk Rim², Chang-Ki Baek², Alon Ascoli¹, Ronald Tetzlaff¹, Larysa Baraban^{1,*}, and Gianaurelio Cuniberti¹

¹ Technische Universität Dresden, Germany

² Pohang University of Science and Technology, Republic of Korea



We demonstrate the biosensing of the Ebola VP40 matrix protein in liquid samples, using a memristor mode of a nanodevice. Further, we show the advantages of controlling the voltage gap via external voltage, which allows the sensing of both positive and negative charges.

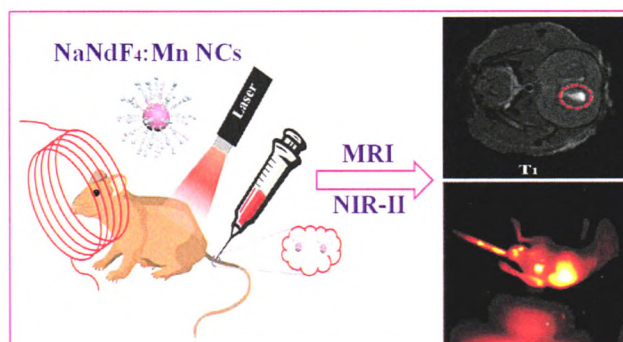
1057–1068

Single ultrasmall Mn²⁺-doped NaNdF₄ nanocrystals as multimodal nanoprobe for magnetic resonance and second near-infrared fluorescence imaging

Xin Wang^{1,*}, Huishan Hu^{1,2}, Hailu Zhang¹, Chunyan Li¹, Baoli An², and Jianwu Dai^{1,*}

¹ Suzhou Institute of Nano-Tech and Nano-Bionics, Chinese Academy of Sciences, China

² Shanghai University, China



Ultrasmall NaNdF₄:Mn nanocrystals have been developed as multimodal nanoprobe for high-performing magnetic resonance (MR)/second near infrared (NIR-II)/computed tomography (CT) imaging, as demonstrated by *in vitro*, *in vivo*, and *ex vivo* experiments.

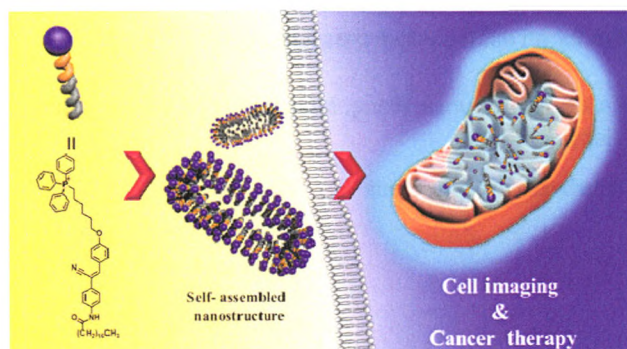
1069–1081

Mitochondria-targeting self-assembled nanoparticles derived from triphenylphosphonium-conjugated cyanostilbene enable site-specific imaging and anticancer drug delivery

Ka Young Kim¹, Hanyong Jin², Jaehyeon Park¹, Sung Ho Jung¹, Ji Ha Lee¹, Hyesong Park¹, Sung Kuk Kim¹, Jeehyeon Bae², and Jong Hwa Jung^{1,*}

¹ Gyeongsang National University, Republic of Korea

² Chung-Ang University, Republic of Korea



Our findings indicate that applications of N1 as a mitochondrial targeting probe, drug delivery platform, and chemotherapeutic agent provide a unique strategy for potential image-guided therapy as well as site-specific delivery system to cancer cells.

1082–1098

Visible light-driven superoxide generation by conjugated polymers for organic synthesis

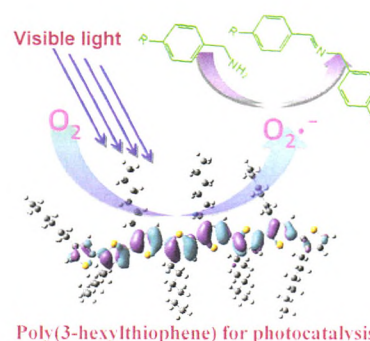
Feili Lai^{1,2}, Yue Wang², Dandan Li³, Xianshun Sun¹, Juan Peng², Xiaodong Zhang^{1,*}, Yupeng Tian³, and Tianxi Liu^{2,4,*}

¹ University of Science and Technology of China, China

² Fudan University, China

³ Anhui University, China

⁴ Donghua University, China



The conjugated polymer poly(3-hexylthiophene) was designed as a metal-free visible light-driven photocatalyst for efficient superoxide generation. For the first time, poly(3-hexylthiophene) nanofibers are reported to exhibit excellent photocatalytic ability toward organic synthesis reactions, being able to catalyze the conversion of a variety of amines into imines by self-coupling with nearly 100% conversion and selectivity under visible light irradiation.

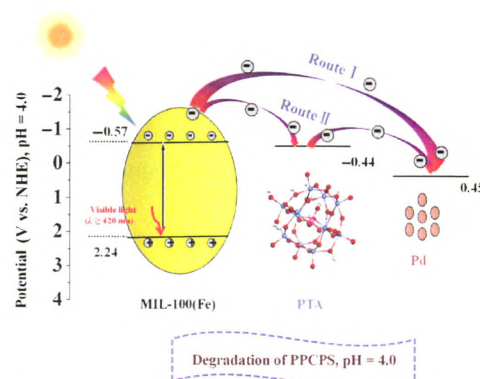
1099–1108

Facile *in situ* growth of highly dispersed palladium on phosphotungstic-acid-encapsulated MIL-100(Fe) for the degradation of pharmaceuticals and personal care products under visible light

Ruowen Liang¹, Renkun Huang¹, Shaoming Ying¹, Xuxu Wang², Guiyang Yan^{1,*}, and Ling Wu^{2,*}

¹ Ningde Normal University, China

² Fuzhou University, China



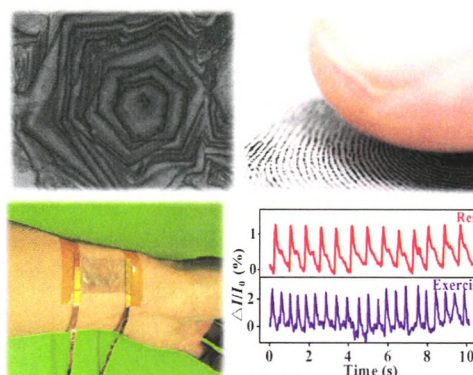
We explore an *in situ* method for preparing Pd-phosphotungstic acid-MIL-100(Fe) nanocomposites (Pd-PTA-MIL-100(Fe)). The resulting Pd-PTA-MIL-100(Fe) nanocomposites show excellent photoactivity toward the degradation of pharmaceuticals and personal care products under visible-light irradiation.

1109–1123

CVD growth of fingerprint-like patterned 3D graphene film for an ultrasensitive pressure sensor

Kailun Xia, Chunya Wang, Muqiang Jian, Qi Wang, and Yingying Zhang*

Tsinghua University, China



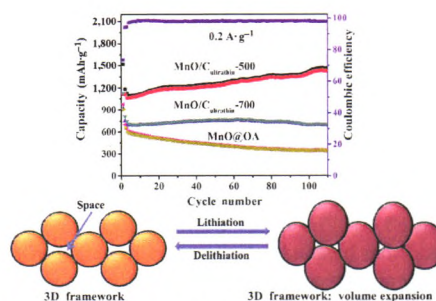
A bionic flexible pressure sensor is fabricated based on fingerprint-like patterned three-dimensional (3D) graphene films and hierarchical structured polydimethylsiloxane (PDMS) films molded from natural leaves. The sensor simultaneously possesses a high sensitivity (up to 110 (kPa)^{-1}), large workable pressure range (up to 75 kPa), low detection limit (0.2 Pa), and fast response ($< 30 \text{ ms}$), showing great potential for health monitoring and human/machine interaction.

1124–1134

Robust 3D network architectures of MnO nanoparticles bridged by ultrathin graphitic carbon for high-performance lithium-ion battery anodes

Jingchun Jia, Xiang Hu, and Zhenhai Wen*

Fujian Institute of Research on the Structure of Matter, Chinese Academy of Sciences, China



A synthetic strategy for the fabrication of robust three-dimensional (3D) network architectures of MnO nanoparticles bridged by an ultrathin graphitic carbon layer is described. The composite has favorable Li-ion storage properties, a high capacity, excellent rate capability, and acceptable cycling stability.

1135–1145

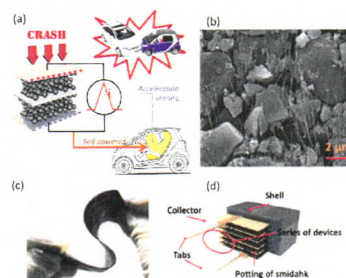
Discharge voltage behavior of electric double-layer capacitors during high-*g* impact and their application to autonomously sensing high-*g* accelerometers

Keren Dai¹, Xiaofeng Wang^{1,*}, Fang Yi², Yajiang Yin¹, Cheng Jiang¹, Simiao Niu³, Qingyu Li¹, and Zheng You^{1,*}

¹ Tsinghua University, China

² Peking University, China

³ Stanford University, USA



A novel integrated device that serves as a power source and as a high-*g* accelerometer is proposed based on a supercapacitor with broad application prospects in automobiles. The design, material preparation, fabrication, and parameter optimization are presented. A dynamic model is used to explain the micro-scale mechanism. The simulation and experimental results reveal the voltage dependency of the high-*g* accelerometer and demonstrate the characteristics of the device.

1146–1156

Integrative square-grid triboelectric nanogenerator as a vibrational energy harvester and impulsive force sensor

Chuan He^{1,2}, Weijun Zhu³, Guang Qin Gu^{1,2,4}, Tao Jiang^{1,2}, Liang Xu^{1,2}, Bao Dong Chen^{1,2}, Chang Bao Han^{1,2}, Dichen Li³, and Zhong Lin Wang^{1,2,5,*}

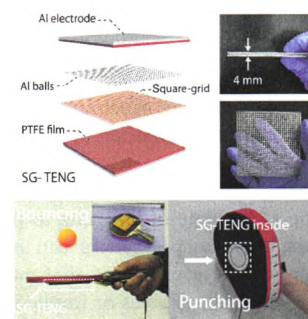
¹ Beijing Institute of Nanoenergy and Nanosystems, Chinese Academy of Sciences, China

² National Center for Nanoscience and Technology (NCNST), China

³ Xi'an Jiaotong University, China

⁴ University of Chinese Academy of Sciences, China

⁵ Georgia Institute of Technology, USA



Square-grid triboelectric nanogenerator that can harvest vibrational energy over a broad bandwidth and operate at different vibrational angles is capable of harvesting the vibrational energy from the impact between a ping pong ball and a racket. Moreover, through integration into a focus mitt, it can be used in various combat sports to monitor the frequency and magnitude of punches or kicks.

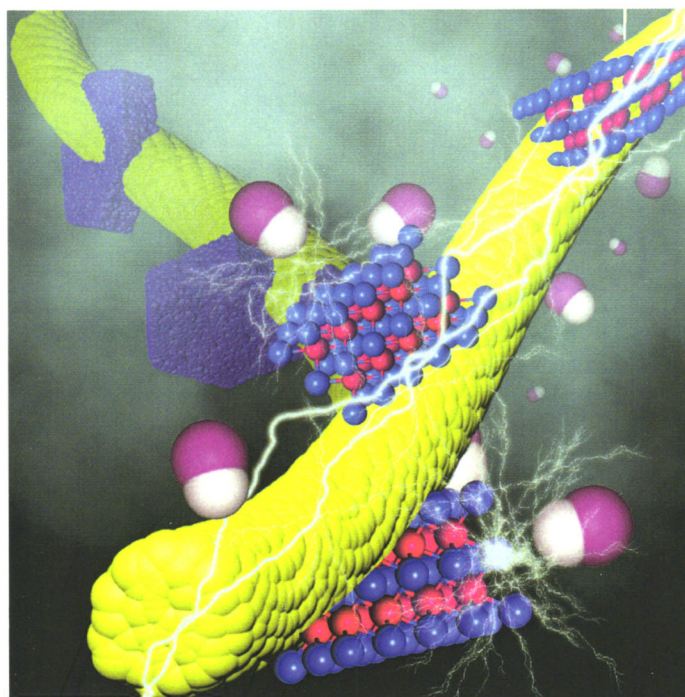
1157–1164

Erratum to: Epitaxial growth of hyperbranched Cu/Cu₂O/CuO core-shell nanowire heterostructures for lithium-ion batteries (DOI 10.1007/s12274-015-0783-1)

1165–1167

Erratum to: Mitochondria-targeting self-assembled nanoparticles derived from triphenylphosphonium-conjugated cyanostilbene enable site-specific imaging and anticancer drug delivery (<https://doi.org/10.1007/s12274-017-1728-7>)

1168



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