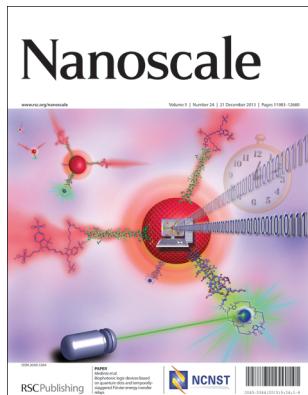


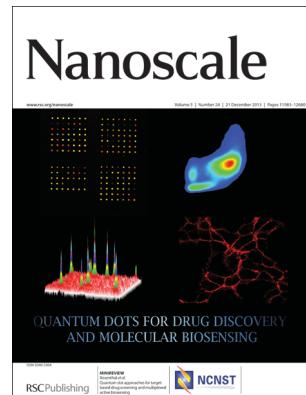
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ISSN 2040-3364 CODEN NANOHL 5(24) 11983–12680 (2013)



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See Medintz *et al.*, pp. 12156–12170.
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Inside cover

See Rosenthal *et al.*, pp. 12072–12081.
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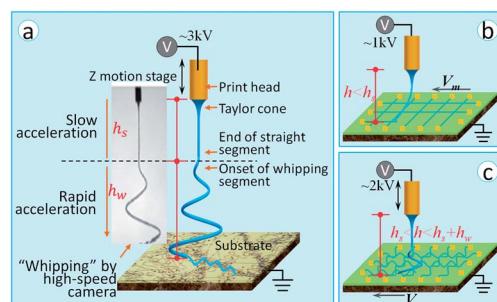
REVIEWS

12007

Electrohydrodynamic direct-writing

YongAn Huang,* Ningbin Bu, Yongqing Duan, Yanqiao Pan, Huimin Liu, Zhouping Yin,* and Youlun Xiong

The electrohydrodynamic direct-writing technique can print nanofibers in a direct, continuous and controllable manner, to satisfy increasing demands of large-area micro/nano-manufacturing.

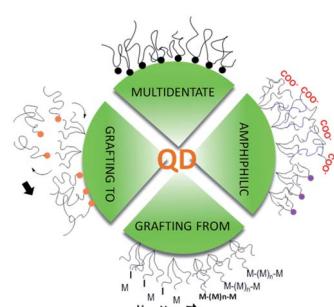


12018

Polymer-coated quantum dots

Nikodem Tomczak,* Rongrong Liu and Julius G. Vancso*

The surface of quantum dots can be coated with polymers using several different methods to provide long-term colloidal stability or to be a source of functional groups for further chemical derivatization.



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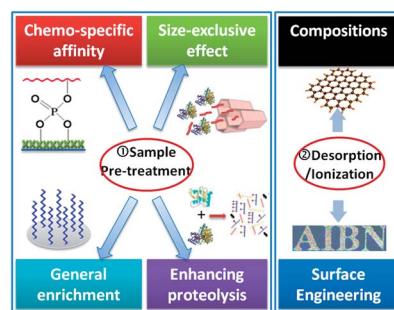
REVIEWS

12033

Applications of nanomaterials in mass spectrometry analysis

Chang Lei, Kun Qian, Owen Noonan, Amanda Nouwens and Chengzhong Yu*

The applications of nanomaterials with various compositions and nanostructures in mass spectrometry based analyses are reviewed according to their functions.



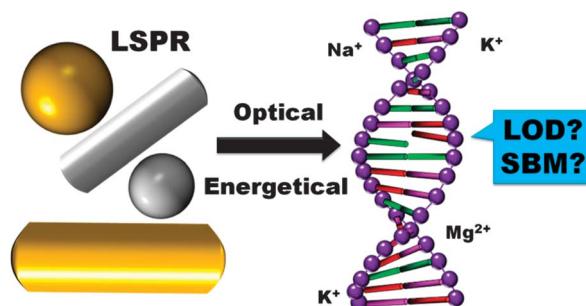
FEATURE ARTICLE

12043

Localized surface plasmon resonance: a unique property of plasmonic nanoparticles for nucleic acid detection

Kah Ee Fong and Lin-Yue Lanry Yung*

LSPR of noble metal nanoparticles for gene detection, with limit of detection and single-base mismatch selectivity as key evaluation parameters.



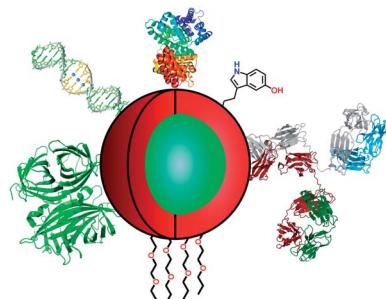
MINIREVIEW

12072

Quantum dot approaches for target-based drug screening and multiplexed active biosensing

Oleg Kovtun, Xochitl Arzeta-Ferrer and Sandra J. Rosenthal*

This mini-review highlights recent advances in quantum dot-based drug screening and bioanalytical sensing.



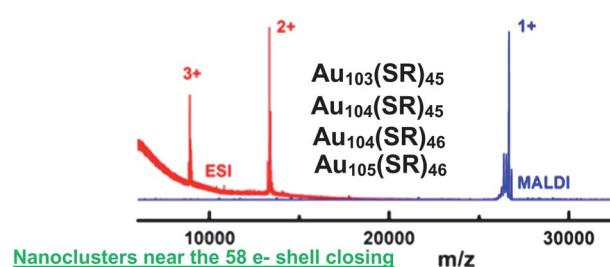
COMMUNICATIONS

12082

 $\text{Au}_{103}(\text{SR})_{45}$, $\text{Au}_{104}(\text{SR})_{45}$, $\text{Au}_{104}(\text{SR})_{46}$ and $\text{Au}_{105}(\text{SR})_{46}$ nanoclusters

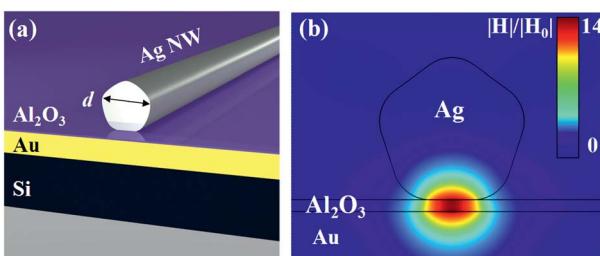
Amala Dass,* Praneeth Reddy Nimmala, Vijay Reddy Jupally and Nuwan Kothalawala

Phenylethane thiol and hexane thiol ligands yield 103-, 104-, and 105- atom clusters that are different to the aromatic protected $\text{Au}_{102}(\text{SPhCOOH})_{44}$ cluster, demonstrating ligand effects.



COMMUNICATIONS

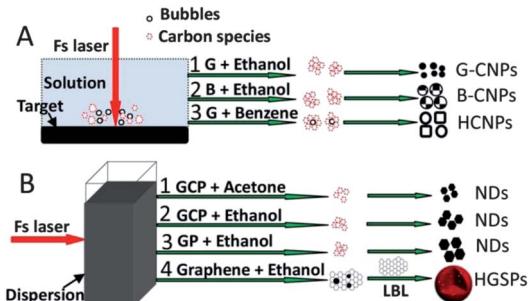
12086

**Photoluminescence via gap plasmons between single silver nanowires and a thin gold film**

Hailong Hu, Yuriy A. Akimov, Huigao Duan, Xianglin Li, Mingyi Liao, Rachel Lee Siew Tan, Lin Wu, Hongyu Chen, Hongjin Fan, Ping Bai, Pooi See Lee, Joel K. W. Yang* and Ze Xiang Shen*

The heterogeneous system of an Ag nanowire on an unpatterned Au film exhibiting strong photoluminescence due to gap plasmons (H-field distribution shown).

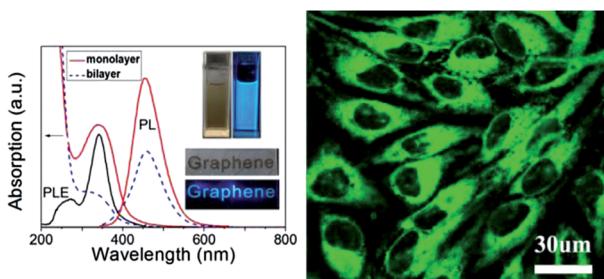
12092

**Photoinduced luminescent carbon nanostructures with ultra-broadly tailored size ranges**

Dezhi Tan, Yuya Yamada, Shifeng Zhou, Yasuhiko Shimotsuma, Kiyotaka Miura and Jianrong Qiu*

Luminescent carbon nanostructures with ultra-broadly tailored size ranges and optical properties are fabricated by femtosecond laser ablation in solution.

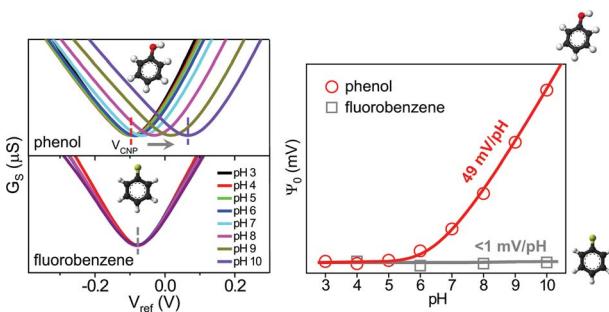
12098

**Nearly monodisperse graphene quantum dots fabricated by amine-assisted cutting and ultrafiltration**

Qi Xue, He Huang, Liang Wang, Zhiwen Chen, Minghong Wu, Zhen Li* and Dengyu Pan*

We report a novel procedure involving polyethylenimine-assisted hydrothermal cutting and subsequent ultrafiltration for fabricating nearly monodisperse graphene quantum dots.

12104

**High mobility graphene ion-sensitive field-effect transistors by noncovalent functionalization**

W. Fu,* C. Nef, A. Tarasov, M. Wipf, R. Stoop, O. Knopfmacher, M. Weiss, M. Calame and C. Schönenberger*

A significant pH response of graphene FETs can be achieved by using aromatic functionalization.

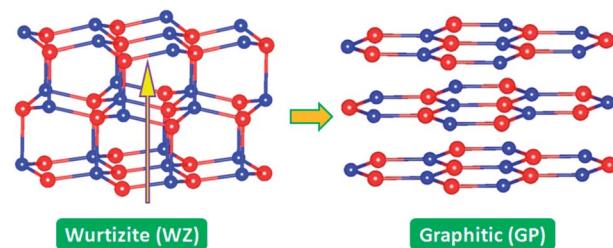
COMMUNICATIONS

12111

Stability of graphitic-like zinc oxide layers under carriers doping: a first-principles study

Erjun Kan,* Kaiming Deng and Fang Wu*

The stability of graphitic–ZnO layers is gradually reduced with the increasing of doped electrons.

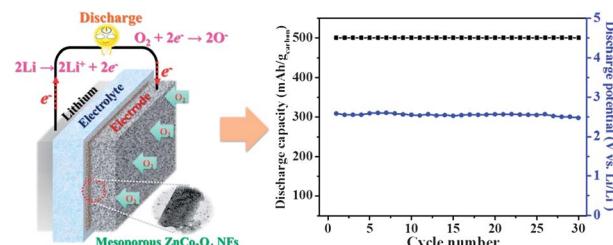


12115

Mesoporous ZnCo₂O₄ nanoflakes with bifunctional electrocatalytic activities toward efficiencies of rechargeable lithium–oxygen batteries in aprotic media

Tai-Feng Hung, Saad Gomaa Mohamed,
Chin-Chang Shen, Yuan-Quei Tsai, Wen-Sheng Chang
and Ru-Shi Liu*

2D mesoporous ZnCo₂O₄ nanoflakes yielded stable cyclability at a cut-off capacity of 500 mA h g_{Carbon}⁻¹ in the case of aprotic Li-O₂ batteries were demonstrated.

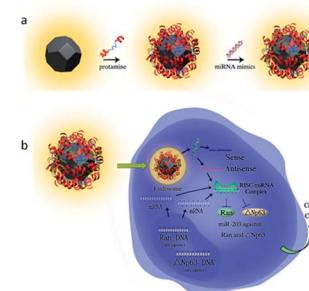


12120

Protamine sulfate–nanodiamond hybrid nanoparticles as a vector for MiR-203 restoration in esophageal carcinoma cells

Minjun Cao, Xiongwei Deng, Shishuai Su, Fang Zhang, Xiangqian Xiao, Qin Hu, Yongwei Fu, Burton B. Yang, Yan Wu,* Wang Sheng* and Yi Zeng

Protamine-functionalized nanodiamond has a great potential to be a biocompatible nanomaterial in miRNA-based cancer therapy.

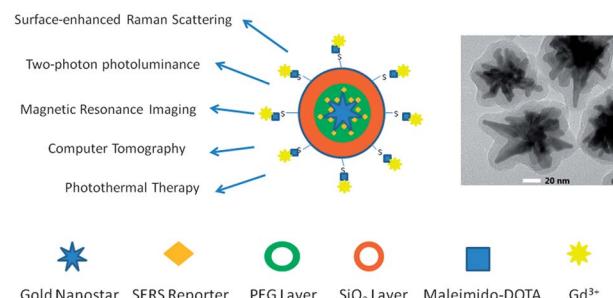


12126

Quintuple-modality (SERS-MRI-CT-TPL-PTT) plasmonic nanoprobe for theranostics

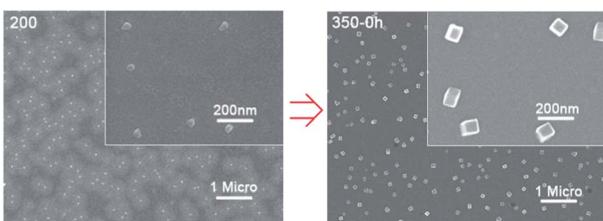
Yang Liu, Zheng Chang, Hsiangkuo Yuan,
Andrew M. Fales and Tuan Vo-Dinh*

Quintuple-modal plasmonic nanoprobe for tumor diagnostics and theranostics.



COMMUNICATIONS

12132

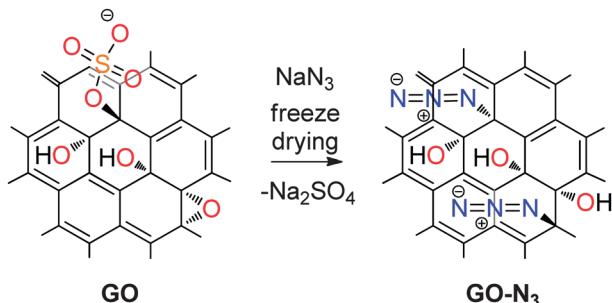


Synthesis of silver nanocubes with controlled size using water-soluble poly(amic acid) salt as the intermediate via a novel ion-exchange self-assembly technique

Shengli Qi, Xiangyue Shen, Zhiwei Lin, GuoFeng Tian, Dezhen Wu * and Riguang Jin

A novel ion-exchange self-assembly technique was established in this work for preparing silver nanostructures with regular shape and controlled size.

12136

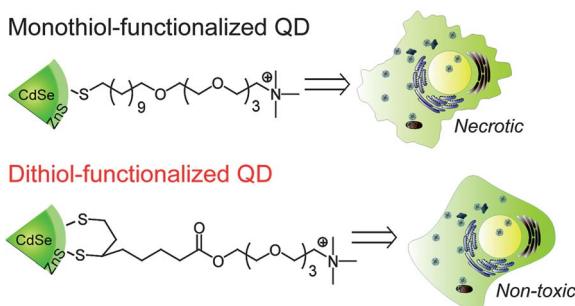


Controlled functionalization of graphene oxide with sodium azide

Siegfried Eigler,* Yichen Hu, Yoshitaka Ishii and Andreas Hirsch

Graphene oxide (GO) with an almost intact carbon framework is functionalized by azide on its surface preserving the basic structure.

12140

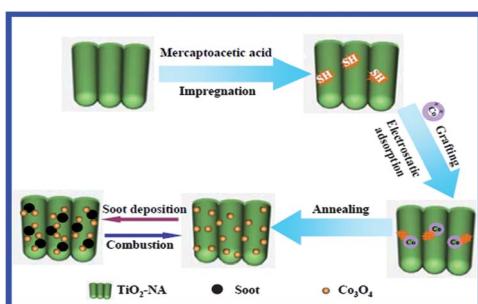


The role of ligand coordination on the cytotoxicity of cationic quantum dots in HeLa cells

Yi-Cheun Yeh, Krishnendu Saha, Bo Yan, Oscar R. Miranda, Xi Yu and Vincent M. Rotello *

The role of surface structure in the cytotoxicity of the cationic CdSe/ZnS quantum dots (QDs) featuring quaternary ammonium functionality has been systematically investigated in HeLa cells.

12144



Domain-confined catalytic soot combustion over Co_3O_4 anchored on a TiO_2 nanotube array catalyst prepared by mercaptoacetic acid induced surface-grafting

Jiale Ren, Yifu Yu, Fangfang Dai, Ming Meng,* Jing Zhang, Lirong Zheng and Tiandou Hu

Co_3O_4 nanocrystals anchored on TiO_2 nanotubes were prepared by mercaptoacetic acid induced surface-grafting, which exhibit high performance for soot combustion.

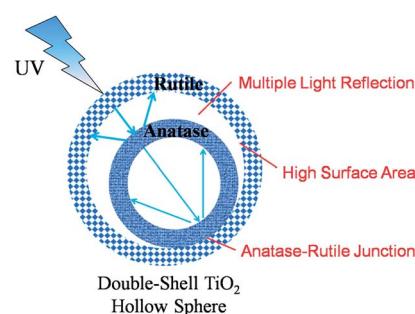
COMMUNICATIONS

12150

Synthesis of the double-shell anatase–rutile TiO_2 hollow spheres with enhanced photocatalytic activity

Shunxing Li,* Jie Chen, Fengying Zheng, Yancai Li and Fuying Huang

Novel double-shell TiO_2 hollow spheres with an inner anatase shell and an outer rutile shell were synthesized and showed remarkably enhanced photoactivity for the degradation of rhodamine B.



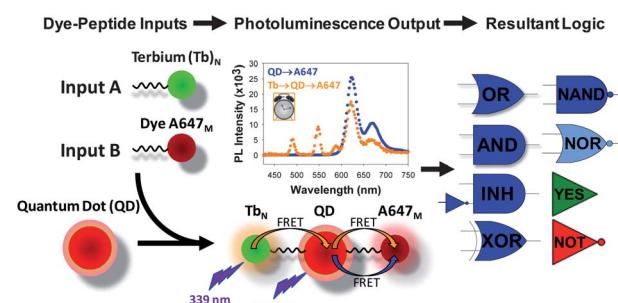
PAPERS

12156

Biophotonic logic devices based on quantum dots and temporally-staggered Förster energy transfer relays

Jonathan C. Claussen, W. Russ Algar, Niko Hildebrandt, Kimihiro Susumu, Mario G. Ancona and Igor L. Medintz*

Terbium complexes and Alexa Fluor 647 are conjugated to quantum dots via polyhistidine-peptides producing spectrotemporal photoluminescence that is converted into logic gates.

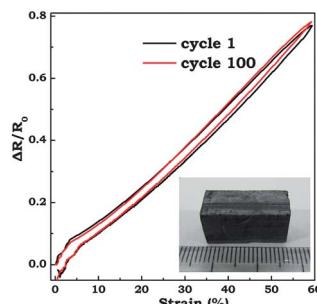


12171

A hierarchically structured graphene foam and its potential as a large-scale strain-gauge sensor

Jun Kuang, Luqi Liu,* Yun Gao, Ding Zhou, Zhus Chen, Baohang Han and Zhong Zhang*

Electrically conductive ReG foam with macroporous hierarchical structures has excellent piezoresistivity and has potential as a large-scale strain-gauge sensor.

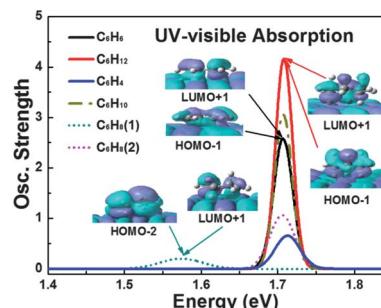


12178

Signatures in vibrational and UV-visible absorption spectra for identifying cyclic hydrocarbons by graphene fragments

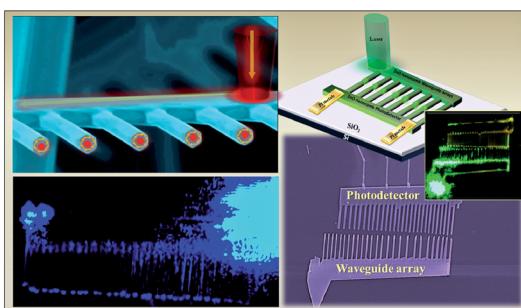
Yan Meng, Qi Wu, Lei Chen, Sonam Wangmo, Yang Gao, Zhigang Wang,* Rui-Qin Zhang,* Dajun Ding, Thomas A. Niehaus and Thomas Frauenheim

Obvious different characteristics in the spectra of different cyclic organic hydrocarbons adsorbed on graphene fragments are useful for the design of molecular recognition devices based on graphene.



PAPERS

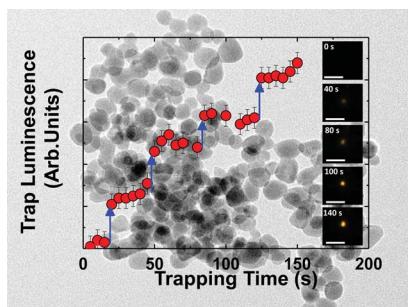
12185


Integrated optical waveguide and photodetector arrays based on comb-like ZnO structures

Afsal Manekkathodi, Yi-Jen Wu, Li-Wei Chu, Shangjr Gwo, Li-Jen Chou and Lih-Juann Chen*

We demonstrated a novel design for an integrated micro-photonic device unit that integrates an optical waveguide array with an electrically-driven photo-sensor array exploiting the collective optical functionalities of ZnO nanocomb structures.

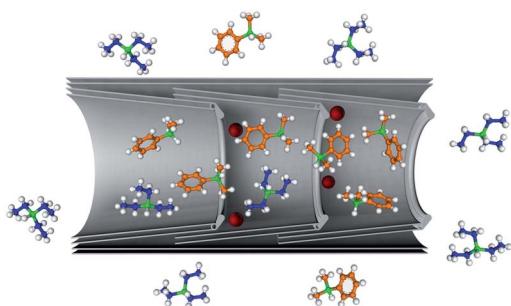
12192


Optical trapping of $\text{NaYF}_4:\text{Er}^{3+},\text{Yb}^{3+}$ upconverting fluorescent nanoparticles

P. Haro-González, B. del Rosal, L. M. Maestro, E. Martín Rodríguez, R. Naccache, J. A. Capobianco, K. Dholakia, J. García Solé and D. Jaque*

Optical trapping and real time detection of erbium-ytterbium doped NaYF_4 upconverting nanoparticles are demonstrated by using a single 980 nm laser beam.

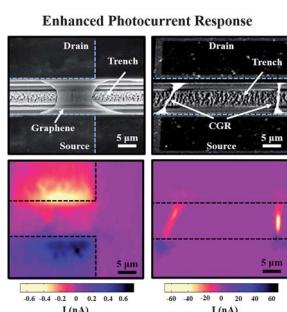
12200


Competitive hydrosilylation in carbon nanoreactors: probing the effect of nanoscale confinement on selectivity

William A. Solomonsz, Graham A. Rance,* Benjamin J. Harris and Andrei N. Khlobystov*

Local concentration effects inside carbon nanoreactors are quantified, where we observe the preferential encapsulation of reactants bearing aromatic moieties.

12206


Enhanced photoresponse in curled graphene ribbons

Zeynab Jarrahi, Yunhao Cao, Tu Hong, Yevgeniy S. Puzyrev, Bin Wang, Junhao Lin, Alex H. Huffstutter, Sokrates T. Pantelides and Ya-Qiong Xu*

Curling 2d graphene membranes into quasi-1d ribbons can strongly enhance their photocurrent response.

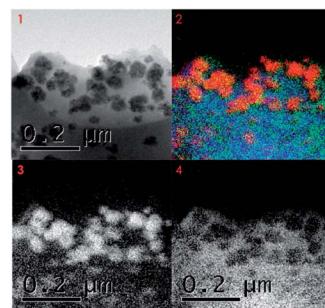
PAPERS

12212

Controlling nickel nanoparticle size in an organic/metal–organic matrix through the use of different solvents

Adam Berlie,* Ian Terry and Marek Szablewski

The magnetism of nickel nanoparticles is shown to be controlled through the use of different solvents within the synthesis.

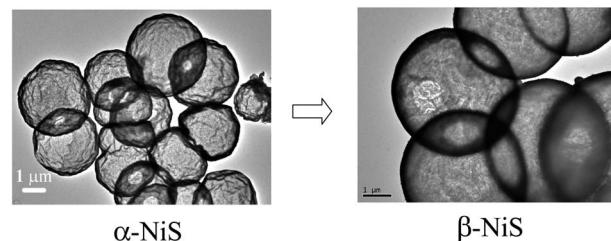


12224

Evolution of nickel sulfide hollow spheres through topotactic transformation

Chengzhen Wei, Qingyi Lu,* Jing Sun and Feng Gao*

Single-crystalline β -NiS hollow spheres with uniform phase and morphology were prepared through evolving from polycrystalline α -NiS hollow spheres.

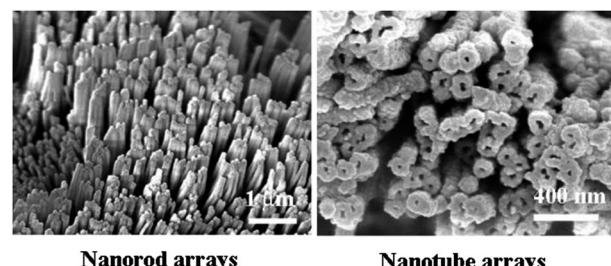


12231

Bi-directional-bi-dimensionality alignment of self-supporting Mn_3O_4 nanorod and nanotube arrays with different bacteriostasis and magnetism

Qun Chen, Chengzhen Wei, Feng Gao,* Huan Pang and Qingyi Lu*

Self-supported Mn_3O_4 nanorod and nanotube patterns were synthesized through a bi-directional-bi-dimensionality growth model and display different bacteriostasis and magnetism.

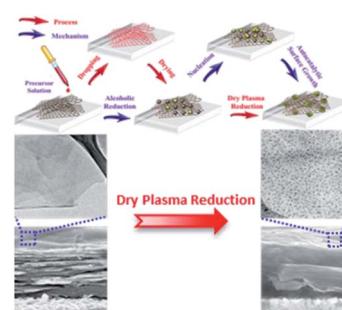


12237

Graphene–platinum nanohybrid as a robust and low-cost counter electrode for dye-sensitized solar cells

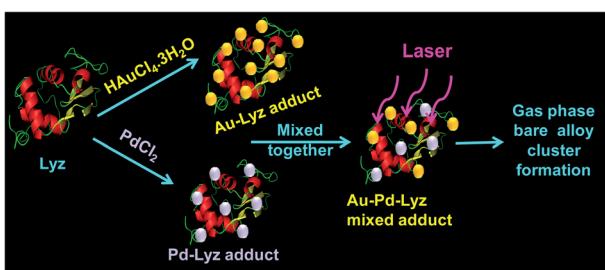
Van-Duong Dao, Nguyen Thi Quynh Hoa, Liudmila L. Larina, Joong-Kee Lee and Ho-Suk Choi*

Graphene–platinum nanohybrids exhibit robust stability as well as ultrahigh electrochemical activity in dye-sensitized solar cells using just a small amount of platinum, owing to a repair of structural damage of graphene as well as chemical bonding between platinum and graphene.



PAPERS

12245

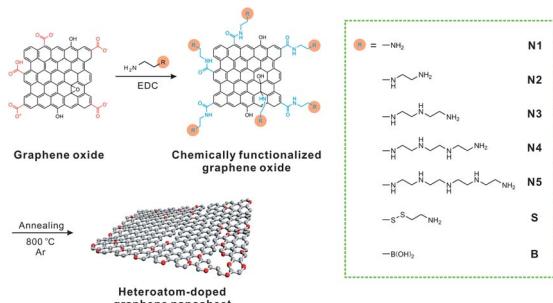


Noble metal alloy clusters in the gas phase derived from protein templates: unusual recognition of palladium by gold

Ananya Baksi and T. Pradeep*

Matrix assisted laser desorption ionization of Au-Pd mixed adduct of lysozyme produces naked alloy clusters in the gas phase. Pd is selectively recognized by gold in the gas phase among a series of metal ions used to form adducts.

12255

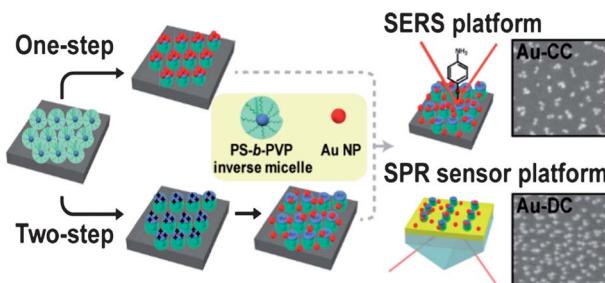


Covalent functionalization based heteroatom doped graphene nanosheet as a metal-free electrocatalyst for oxygen reduction reaction

Minju Park, Taemin Lee and Byeong-Su Kim*

We report a facile synthesis of heteroatom doped graphene oxide nanosheets through covalent functionalization for metal-free electrocatalysts.

12261

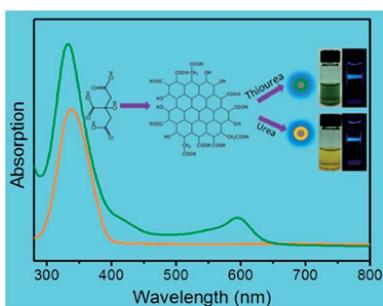


Configuration-controlled Au nanocluster arrays on inverse micelle nano-patterns: versatile platforms for SERS and SPR sensors

Yoon Hee Jang, Kyungwha Chung, Li Na Quan, Barbora Špačková, Hana Sípová, Seyoung Moon, Won Joon Cho, Hae-Young Shin, Yu Jin Jang, Ji-Eun Lee, Saji Thomas Kochuveedu, Min Ji Yoon, Jihyeon Kim, Seokhyun Yoon, Jin Kon Kim, Donghyun Kim, Jiří Homola and Dong Ha Kim*

Au nanocluster arrays with controlled configuration are exploited as advanced platforms for SERS and SPR sensors.

12272



Highly luminescent S, N co-doped graphene quantum dots with broad visible absorption bands for visible light photocatalysts

Dan Qu, Min Zheng, Peng Du, Yue Zhou, Ligong Zhang,* Di Li, Huaqiao Tan, Zhao Zhao, Zhigang Xie and Zaicheng Sun*

A facile hydrothermal synthesis route to N and S, N co-doped graphene quantum dots (GQDs) was developed by using citric acid as the C source and urea or thiourea as N and S sources.

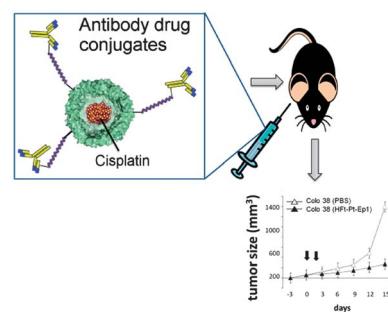
PAPERS

12278

Antibody–drug conjugates: targeting melanoma with cisplatin encapsulated in protein-cage nanoparticles based on human ferritin

Elisabetta Falvo, Elisa Tremante, Rocco Fraioli, Carlo Leonetti, Carlotta Zamparelli, Alberto Boffi, Veronica Morea, Pierpaolo Ceci* and Patrizio Giacomini

A novel antibody–drug conjugate (ADC) was synthesized incorporating ferritin-based nanoparticles containing cisplatin. This ADC is able to specifically deliver anticancer drugs to melanoma both *in vitro* and *in vivo*.

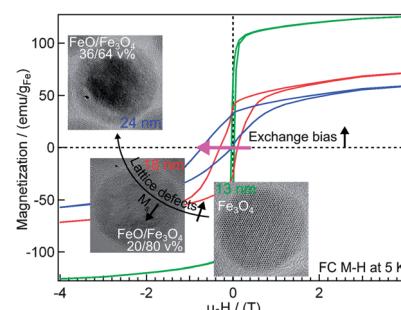


12286

Size dependent structural and magnetic properties of $\text{FeO}-\text{Fe}_3\text{O}_4$ nanoparticles

Aidin Lak,* Mathias Kraken, Frank Ludwig,* Andreas Kornowski, Dietmar Eberbeck, Sibylle Sievers, F. J. Litterst, Horst Weller and Meinhard Schilling

Structural, phase compositional and magnetic properties of monodisperse iron oxide nanoparticles were correlated for a broad range of particle sizes.

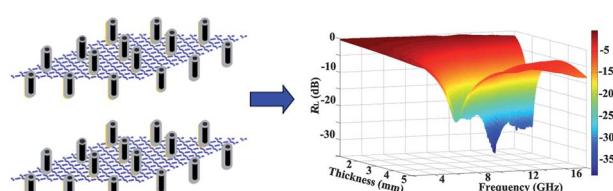


12296

Three-dimensional $\text{SiO}_2@\text{Fe}_3\text{O}_4$ core/shell nanorod array/graphene architecture: synthesis and electromagnetic absorption properties

Yulan Ren, Chunling Zhu, Shen Zhang, Chunyan Li, Yujin Chen,* Peng Gao,* Piaoping Yang* and Qiuyun Ouyang

A three-dimensional $\text{SiO}_2@\text{Fe}_3\text{O}_4$ core/shell nanorod array/graphene architecture was fabricated by a seed-assisted method, and more than 99% of the electromagnetic wave energy could be attenuated by the 3D architecture with an addition amount of only 20 wt% in the paraffin matrix.

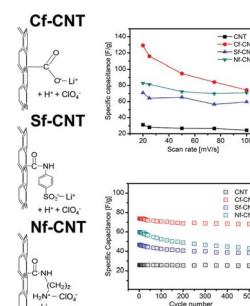


12304

Surface functional groups of carbon nanotubes to manipulate capacitive behaviors

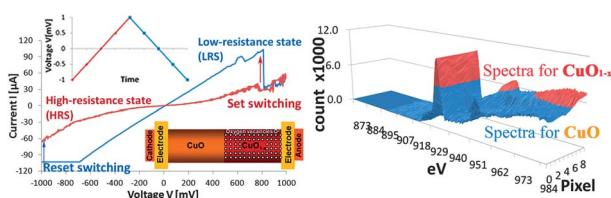
Sul Ki Park, Qasim Mahmood and Ho Seok Park*

The supercapacitive behaviors of CNTs can be manipulated by the surface functional moieties due to the interplay with lithium ions.



PAPERS

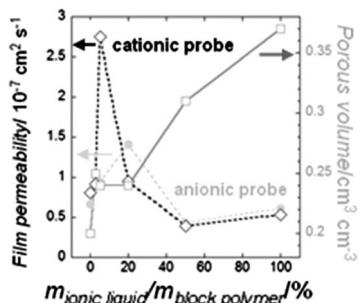
12310

**In situ forming, characterization, and transduction of nanowire memristors**

Zheng Fan, Xudong Fan, Alex Li and Lixin Dong *

We report the nanorobotic *in situ* forming, characterization, and transduction of memristors based on individual copper oxide nanowires.

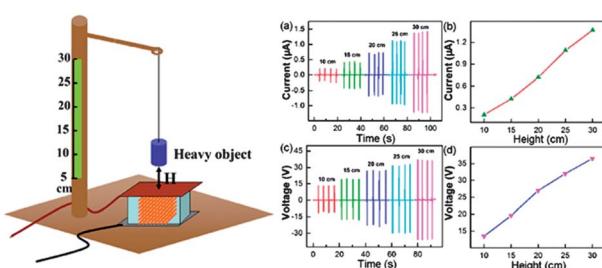
12316

**Bimodal mesoporous titanium dioxide anatase films templated by a block polymer and an ionic liquid: influence of the porosity on the permeability**

Sébastien Sallard,* Michael Schröder, Cédric Boissière, Christian Dunkel, Mathieu Etienne, Alain Walcarus, Torsten Oekermann, Michael Wark and Bernd M. Smarsly

The highest permeability of bimodal mesoporous anatase films does not correspond to the highest porous volume recorded.

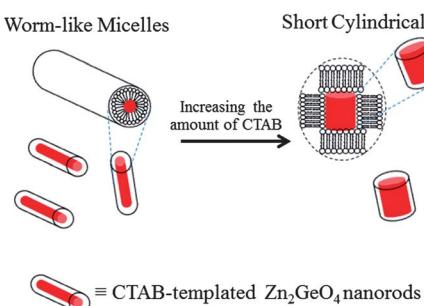
12330

**Silicon nanowires nanogenerator based on the piezoelectricity of alpha-quartz**

Kui Yin, Haiyang Lin, Qian Cai, Yi Zhao, Shuit-Tong Lee,* Fei Hu and Mingwang Shao*

Alpha-quartz was grown in silicon nanowires and fabricated piezoelectric nanogenerators with maximal output of 36.5 V and 1.4 μA.

12335

**Core-shell Zn₂GeO₄ nanorods and their size-dependent photoluminescence properties**

Songping Wu,* Zhuolin Wang, Xin Ouyang and Zhiqun Lin*

Size-tunable crystalline core–crystalline shell Zn₂GeO₄ nanorods synthesized *via* a facile hydrothermal reaction possessed size-dependent photoluminescence.

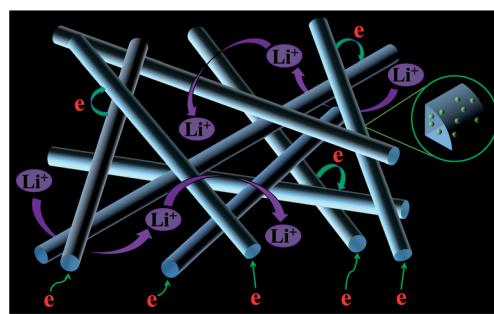
PAPERS

12342

CoO–carbon nanofiber networks prepared by electrospinning as binder-free anode materials for lithium-ion batteries with enhanced properties

Ming Zhang, Evan Uchaker, Shan Hu, Qifeng Zhang, Taihong Wang,* Guozhong Cao* and Jiangyu Li

CoO–carbon nanofiber networks as binder-free anodes with high properties for Li^+ storage were prepared by electrospinning.

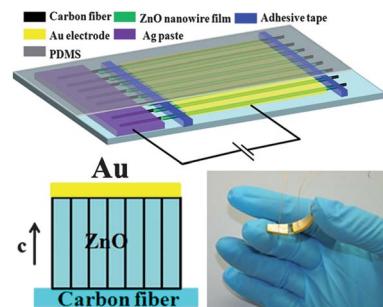


12350

Carbon fiber–ZnO nanowire hybrid structures for flexible and adaptable strain sensors

Qingliang Liao, Markus Mohr, Xiaohui Zhang, Zheng Zhang, Yue Zhang* and Hans-Jörg Fecht*

The novel flexible piezotronic strain sensors fabricated by using carbon fiber–ZnO nanowire hybrid structures show an excellent response to mechanical loads.

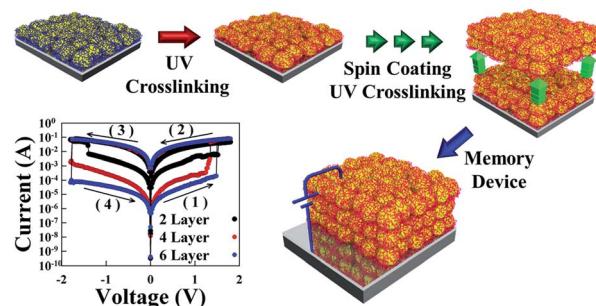


12356

Inorganic nanoparticle multilayers using photo-crosslinking layer-by-layer assembly and their applications in nonvolatile memory devices

Sanghyuk Cheong, Younghoon Kim, Taegyun Kwon, Bumjoon J. Kim and Jinhan Cho*

We introduce a general and facile method, photo-crosslinked layer-by-layer (LbL) assembly, for the preparation of inorganic nanoparticle (NP)-based multilayer films. These films can be applied to nonvolatile memory device.

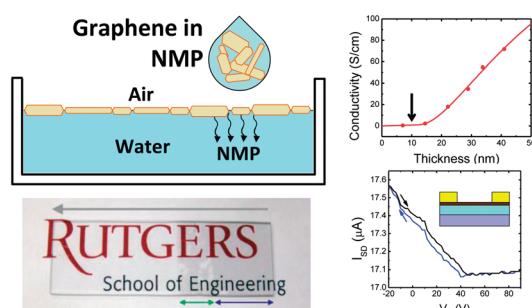


12365

Optoelectronic properties of graphene thin films deposited by a Langmuir–Blodgett assembly

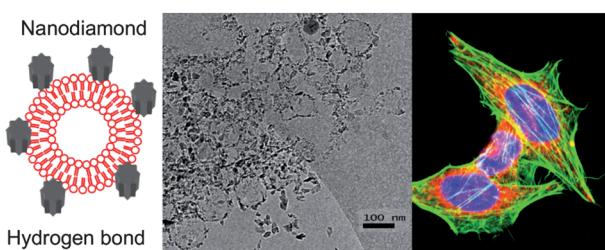
HoKwon Kim,* Cecilia Mattevi,* Hyun Jun Kim, Anudha Mittal, K. Andre Mkhoyan, Richard E. Riman and Manish Chhowalla

Controllable deposition of unfunctionalized graphene platelets dispersed in *N*-methyl-2-pyrrolidone (NMP) via a Langmuir–Blodgett assembly provides graphene nanostructure networks with high transparency, percolative conduction, and ambipolar transport.



PAPERS

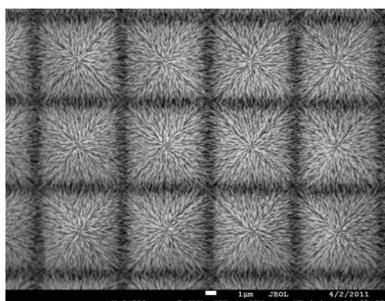
12375

**Nanodiamond decorated liposomes as highly biocompatible delivery vehicles and a comparison with carbon nanotubes and graphene oxide**

Feng Wang and Juewen Liu*

Nanodiamond adsorbs on zwitterionic DOPC liposomes via hydrogen bonds and the complex can be internalized by cancer cells.

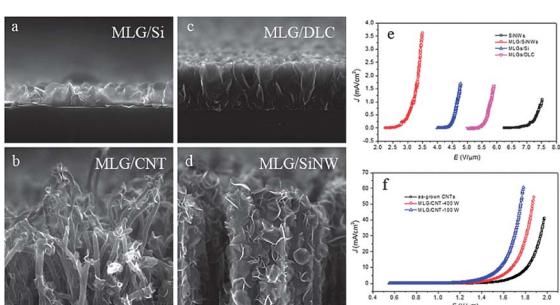
12383

**Bio-inspired antireflective hetero-nanojunctions with enhanced photoactivity**

Dianpeng Qi, Liyan Zheng, Xuebo Cao, Yueyue Jiang, Hongbo Xu, Yanyan Zhang, Bingjie Yang, Yinghui Sun, Huey Hoon Hng, Nan Lu,* Lifeng Chi* and Xiaodong Chen*

A bio-inspired antireflective hetero-nanojunction structure fabricated by the hydrothermal growth of ZnO nanorods on silicon micro-pyramids has shown enhanced photoactivity.

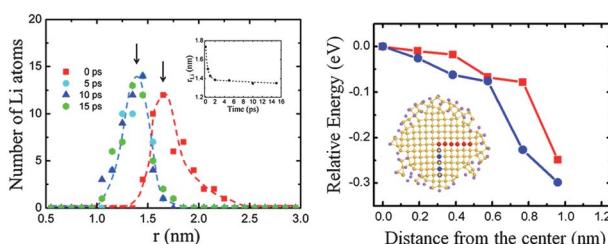
12388

**Self-assembled growth of multi-layer graphene on planar and nano-structured substrates and its field emission properties**

Jian-Hua Deng,* Bin Yu, Guo-Zheng Li, Xing-Gang Hou, Meng-Li Zhao, De-Jun Li, Rui-Ting Zheng and Guo-An Cheng*

Self-assembled growth of multi-layer graphenes on planar and nanostructured substrates was realized. Their substrate dependent field emission properties are discussed.

12394

**Self-stopping effects of lithium penetration into silicon nanowires**

Li Lang, Chuanding Dong, Guohong Chen, Jihui Yang, Xiao Gu, Hongjun Xiang, Ruqian Wu and Xingao Gong

Using first-principles molecular dynamics simulations, we demonstrate that the penetration of lithium atoms into a silicon nanowire (SiNW) self-stops once a metallic amorphous Li-Si shell forms.

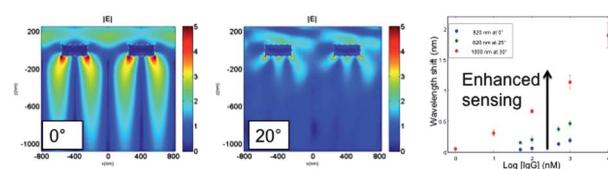
PAPERS

12399

Tuning the 3D plasmon field of nanohole arrays

Maxime Couture, Yuzhang Liang,
Hugo-Pierre Poirier Richard, Rita Faid, Wei Peng*
and Jean-Francois Masson*

Grating coupling conditions are optimized to enhance sensitivity.

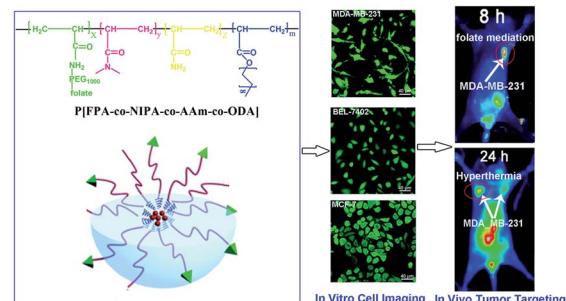


12409

Thermal responsive micelles for dual tumor-targeting imaging and therapy

Haiyan Chen,* Bowen Li, Jiadan Qiu, Jiangyu Li, Jing Jin,
Shuhang Dai, Yuxiang Ma and Yueqing Gu*

Folate and thermal co-mediated micelles demonstrated favorable tumor-targeting efficiency both at cell level and animal level.

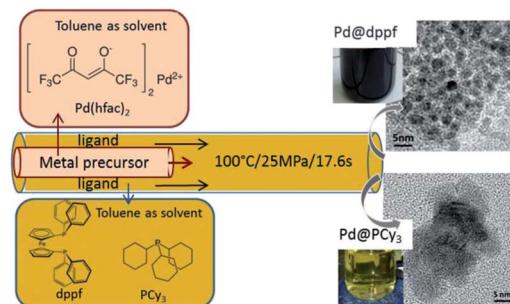


12425

Continuous coflow synthesis of hybrid palladium nanocrystals as catalysts for borylation reaction

Oana Pascu, Ludovic Marciasini, Samuel Marre,
Michel Vaultier, Mathieu Pucheaule* and Cyril Aymonier*

The combination of highly active Pd nanocrystal (NC) types with tailored surface properties (various ligands) – e.g. organic–inorganic hybrid NCs – as catalysts opens avenues towards new synthetic pathways, implying a faster practical alternative for adjusting and screening the reaction conditions.

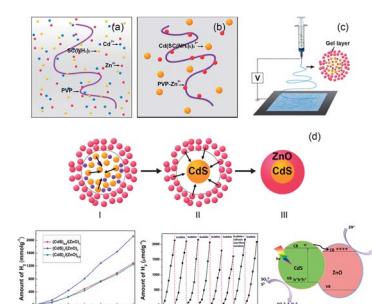


12432

One-dimensional CdS/ZnO core/shell nanofibers via single-spinneret electrospinning: tunable morphology and efficient photocatalytic hydrogen production

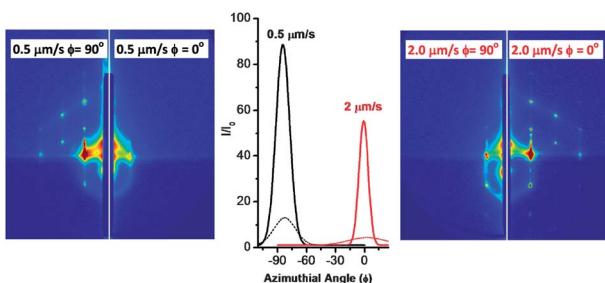
Guorui Yang, Wei Yan,* Qian Zhang, Shaohua Shen*
and Shuijiang Ding

CdS/ZnO core/shell nanofibers were prepared via an electrospinning method, which exhibit excellent photocatalytic performance in water splitting for H₂ evolution. A possible formation mechanism was also introduced.



PAPERS

12440



Facile control of long range orientation in mesoporous carbon films with thermal zone annealing velocity

Jiachen Xue, Gurpreet Singh, Zhe Qiang, Kevin G. Yager, Alamgir Karim and Bryan D. Vogt*

Small changes in zone annealing velocity can switch orientation of cylindrical mesopores from parallel to transverse orientation without any changes in the temperature profile or film composition.

12448

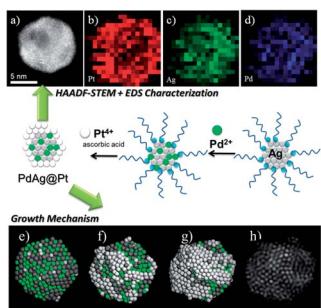


Direct growth of nanotubes and graphene nanoflowers on electrochemical platinum electrodes

Irene Taurino,* Arnaud Magrez, Federico Matteini, László Forró, Giovanni De Micheli and Sandro Carrara

Fabrication of MWCNTs and nanographene onto Pt microelectrodes from different electrodeposited catalyst coatings with promising electrochemical performance for oxidase-based biosensors.

12456

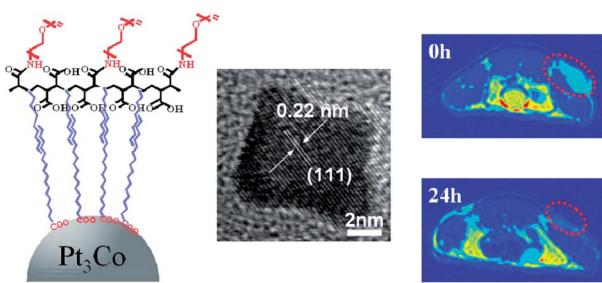


Trimetallic nanostructures: the case of AgPd-Pt multiply twinned nanoparticles

Subarna Khanal, Nabraj Bhattacharai, J. Jesús Velázquez-Salazar, Daniel Bahena, German Soldano, Arturo Ponce, Marcelo M. Mariscal, Sergio Mejía-Rosales and Miguel José-Yacamán*

Here, we report the synthesis, structural characterization, and atomistic simulations of AgPd-Pt trimetallic (TM) nanoparticles, where the AgPd core gets partially encapsulated in a Pt rich shell.

12464



Magnetic PEGylated Pt₃Co nanoparticles as a novel MR contrast agent: *in vivo* MR imaging and long-term toxicity study

Shengnan Yin, Zhiwei Li, Liang Cheng,* Chao Wang, Yumeng Liu, Qian Chen, Hua Gong, Liang Guo,* Yonggang Li* and Zhuang Liu*

A novel magnetic resonance contrast agent based on ultra-small Pt₃Co nanoparticles with high r_2 relaxivity is developed and used for *in vivo* tumor imaging.

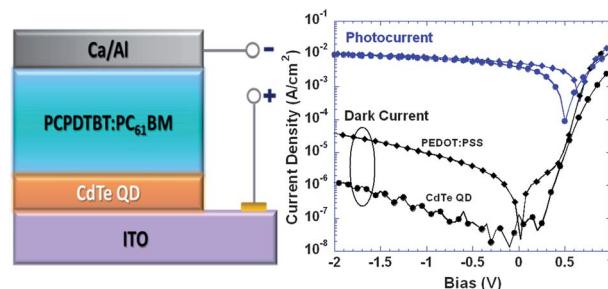
PAPERS

12474

Water-soluble CdTe quantum dots as an anode interlayer for solution-processed near infrared polymer photodetectors

Xilan Liu, Jinjun Zhou, Jie Zheng, Matthew L. Becker* and Xiong Gong*

Wide bandgap CdTe quantum dots as an anode interlayer for ultrasensitive near infrared photodetectors with extremely low dark current density.

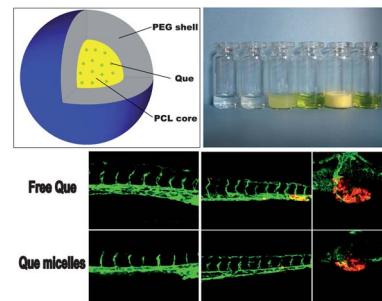


12480

Biodegradable polymeric micelle-encapsulated quercetin suppresses tumor growth and metastasis in both transgenic zebrafish and mouse models

Qinjie Wu, Senyi Deng, Ling Li, Lu Sun, Xi Yang, Xinyu Liu, Lei Liu, Zhiyong Qian, Yuquan Wei and Changyang Gong*

Quercetin loaded polymeric micelles (Que micelles) were prepared to obtain an aqueous formulation of quercetin. Stronger inhibitory effects of Que micelles were observed on angiogenesis, growth, and metastasis of tumors in transgenic zebrafish models and mouse model.



12494

Investigation of facet effects on the catalytic activity of Cu₂O nanocrystals for efficient regioselective synthesis of 3,5-disubstituted isoxazoles

Kaushik Chanda, Sourav Rej and Michael H. Huang*

Graphic Cu₂O rhombic dodecahedra are more efficient catalysts than nanocubes and octahedra for alkyne and *N*-hydroxyimidoyl chloride cycloaddition to generate isoxazoles.

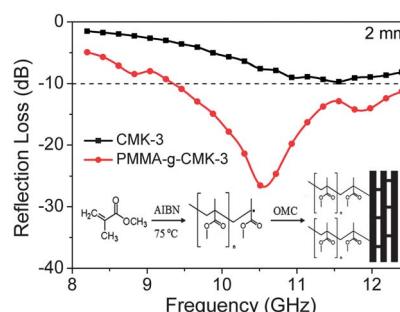


12502

A covalent route for efficient surface modification of ordered mesoporous carbon as high performance microwave absorbers

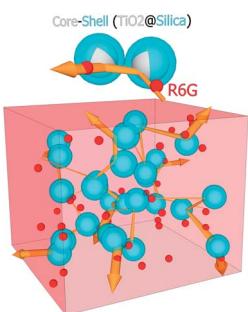
Hu Zhou, Jiacheng Wang,* Jiandong Zhuang and Qian Liu*

In situ polymerized CMK-3/poly(methyl methacrylate) exhibits a reflection loss of -27 dB in the X-band, superior to that (-10 dB) prepared by solvent mixing.



PAPERS

12512

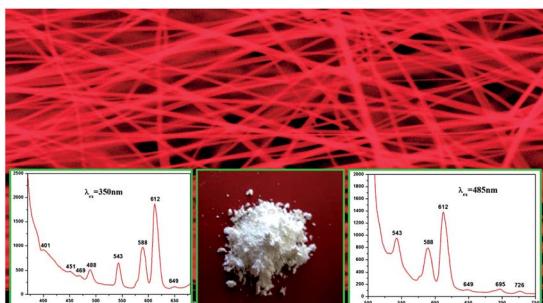


Novel core–shell (TiO_2 @Silica) nanoparticles for scattering medium in a random laser: higher efficiency, lower laser threshold and lower photodegradation

Ernesto Jimenez-Villar,* Valdeci Mestre, Paulo C. de Oliveira and Gilberto F. de Sá

Higher efficiency, narrower bandwidth, lower laser threshold and long photobleaching lifetime in random laser composed of novel core–shell (TiO_2 @Silica) nanoparticles.

12518

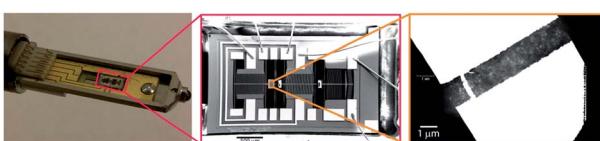


Sol-hydrothermal synthesis and optical properties of Eu^{3+} , Tb^{3+} -codoped one-dimensional strontium germanate full color nano-phosphors*

Liangwu Lin, Xinyuan Sun, Yao Jiang and Yuehui He*

Novel near-UV and blue excited Eu^{3+} , Tb^{3+} -codoped one dimensional strontium germanate full-color nano-phosphors have been successfully synthesized by a simple sol-hydrothermal method.

12532

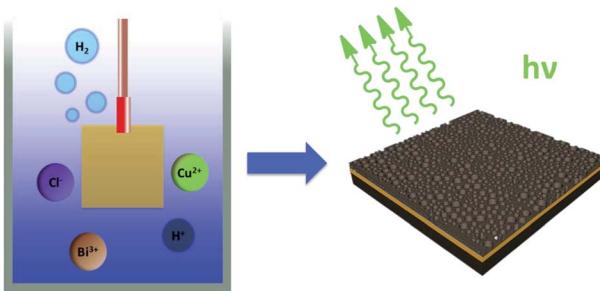


Quantitative *in situ* TEM tensile fatigue testing on nanocrystalline metallic ultrathin films

Ehsan Hosseiniyan and Olivier N. Pierron*

A quantitative *in situ* TEM fatigue testing technique to investigate the fatigue mechanisms of nanomaterials, including nanocrystalline metals.

12542



3D hierarchically porous Cu–BiOCl nanocomposite films: one-step electrochemical synthesis, structural characterization and nanomechanical and photoluminescent properties

Miguel Guerrero,* Salvador Pané, Bradley J. Nelson, Maria Dolors Baró, Mònica Roldán, Jordi Sort* and Eva Pellicer*

One-pot electrochemical synthesis of 3D hierarchically porous Cu–BiOCl nanocomposite films with stable-in-time photoluminescent properties.

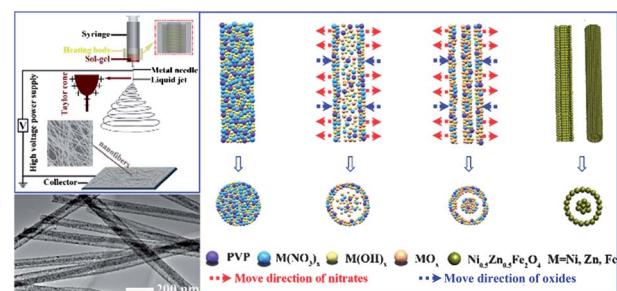
PAPERS

12551

Wire-in-tube structure fabricated by single capillary electrospinning *via* nanoscale Kirkendall effect: the case of nickel-zinc ferrite

Jiecai Fu,* Junli Zhang, Yong Peng, Changhui Zhao, Yongmin He, Zhenxing Zhang, Xiaojun Pan, Nigel J. Mellors and Erqiang Xie*

A wire-in-tube structure was prepared using electrospinning by means of tuning hydrolysis/alcoholysis of a precursor solution *via* the nanoscale Kirkendall effect.

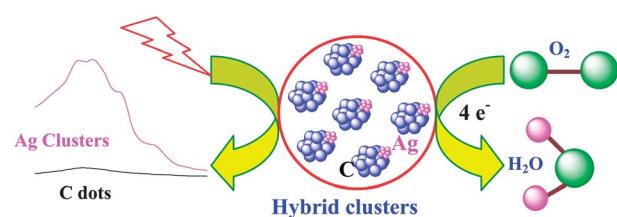


12558

Green synthesis of silver nanoclusters supported on carbon nanodots: enhanced photoluminescence and high catalytic activity for oxygen reduction reaction

Minmin Liu and Wei Chen*

"Surface clean" silver nanoclusters supported on carbon nanodots are synthesized through a green approach and the hybrid nanoclusters exhibit enhanced photoluminescence, high catalytic activity for oxygen reduction and high tolerance to methanol crossover.

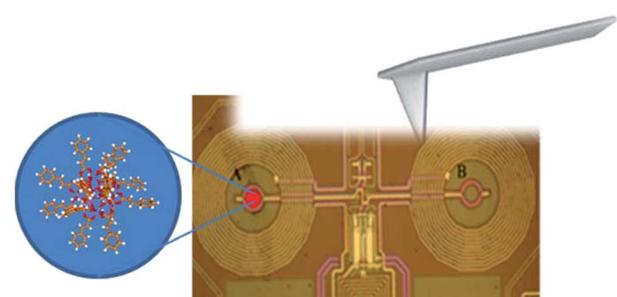


12565

Mn₁₂ single molecule magnets deposited on μ-SQUID sensors: the role of interphases and structural modifications

Elena Bellido, Pablo González-Monje, Ana Repollés, Mark Jenkins, Javier Sesé, Dietmar Drung, Thomas Schurig, Kunio Awaga, Fernando Luis* and Daniel Ruiz-Molina*

Direct measurements of the linear ac susceptibility and magnetic relaxation of a few Mn₁₂ monolayers deposited on a μ-SQUID sensor are reported.

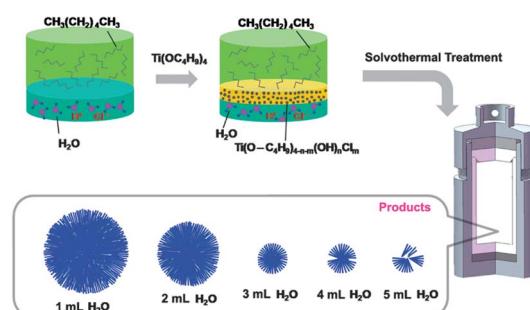


12574

Size-tunable TiO₂ nanorod microspheres synthesised *via* a one-pot solvothermal method and used as the scattering layer for dye-sensitized solar cells

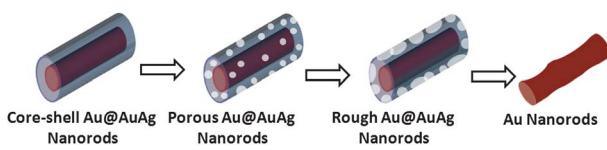
Yichuan Rui, Yaogang Li, Qinghong Zhang* and Hongzhi Wang*

Size-tunable TiO₂ nanorod microspheres were synthesized *via* one-pot solvothermal treatment by adjusting the volume of the reactant water.



PAPERS

12582

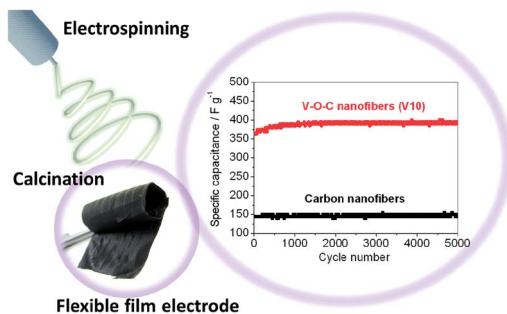


A dealloying process of core–shell Au@AuAg nanorods for porous nanorods with enhanced catalytic activity

Xia Guo, Wei Ye, Hongyan Sun, Qiao Zhang and Jian Yang*

Gold nanorods in a porous shell of an AuAg alloy fabricated via a dealloying process of the core–shell Au@AuAg nanorods at room temperature exhibit unique optical properties and enhanced catalytic activity for the reduction of *p*-nitrophenol.

12589

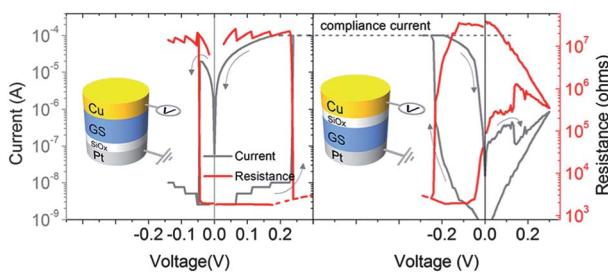


Amorphous V–O–C composite nanofibers electrospun from solution precursors as binder- and conductive additive-free electrodes for supercapacitors with outstanding performance

Xia Chen, Bote Zhao, Yong Cai, Moses O. Tadé and Zongping Shao*

V–O–C composite nanofibers were fabricated by electrospinning as free-standing film electrodes for supercapacitors, delivering an outstanding specific capacitance of 400 F g⁻¹ at 5 A g⁻¹ after 5000 cycles.

12598

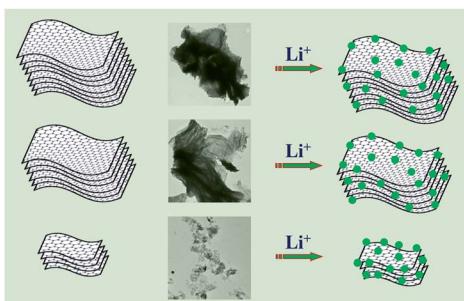


Bipolar switching polarity reversal by electrolyte layer sequence in electrochemical metallization cells with dual-layer solid electrolytes

Rohit Soni,* Paul Meuffels, Adrian Petraru, Mirko Hansen, Martin Ziegler, Ondrej Vavra, Hermann Kohlstedt and Doo Seok Jeong*

Solid electrolyte stack sequence in electrochemical metallization cells employing dual-layer electrolytes ($\text{SiO}_x\text{--Ge}_{0.3}\text{Se}_{0.7}$) is found to determine bipolar switching polarity.

12607



Structurally tailored graphene nanosheets as lithium ion battery anodes: an insight to yield exceptionally high lithium storage performance

Xifei Li, Yuhai Hu, Jian Liu, Andrew Lushington, Ruying Li and Xueliang Sun*

Three types of GNSs with varying size, edge sites, defects and layer numbers have been investigated as anodes in detail.

PAPERS

12616

Bio-inspired *in situ* growth of monolayer silver nanoparticles on graphene oxide paper as multifunctional substrate

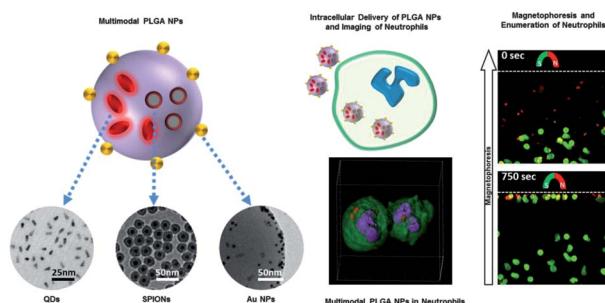
Shi-Kuo Li, You-Xian Yan, Jin-Long Wang and Shu-Hong Yu*

Bio-inspired *in situ* growth of highly dispersed monolayer Ag NPs on rGO paper as a multifunctional substrate.

12624

Design of hybrid multimodal poly(lactic-co-glycolic acid) polymer nanoparticles for neutrophil labeling, imaging and tracking

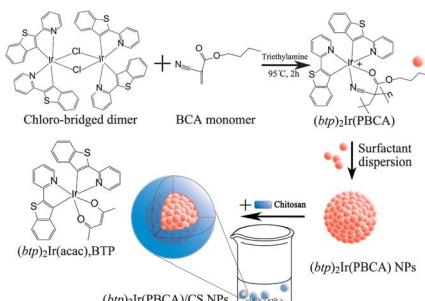
Yuan Qiu, Raghavendra Palankar, María Echeverría, Nikolay Medvedev, Sergio E. Moya* and Mihaela Delcea*

Multimodal poly(lactic-co-glycolic acid) nanoparticles incorporating quantum dots, superparamagnetic iron oxide nanoparticles and gold nanoparticles were fabricated. Such systems are relevant for labeling, imaging, tracking neutrophils and have potential for *in vivo* applications.

12633

Hypoxia-sensitive bis(2-(2'-benzothienyl)pyridinato-*N,C*³)iridium[poly(*n*-butyl cyanoacrylate)]/chitosan nanoparticles and their phosphorescence tumor imaging *in vitro* and *in vivo*

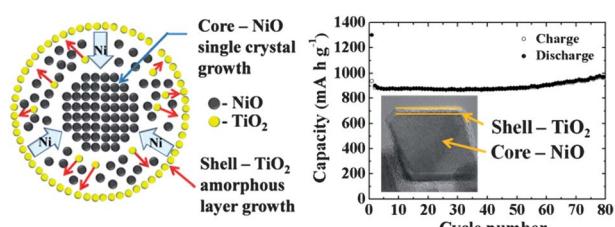
Yun Zeng, Shaojuan Zhang, Menghui Jia, Yang Liu, Jin Shang, Youmin Guo, Jianhua Xu and Daocheng Wu*

Phosphorescent polymeric BTP derivative (*btp*)₂Ir(PBCA)/CS NPs were prepared, which enhanced the tumor imaging effect significantly with lower toxicity.

12645

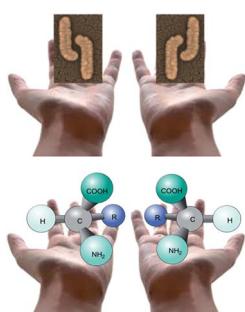
One-pot rapid synthesis of core–shell structured NiO@TiO₂ nanopowders and their excellent electrochemical properties as anode materials for lithium ion batteries

Seung Ho Choi, Jong-Heun Lee and Yun Chan Kang*

A new strategy for the synthesis of core–shell structured nanopowders is introduced. Core–shell structured NiO@TiO₂ nanopowders prepared by flame spray pyrolysis for anode application in lithium-ion batteries have high capacity and good capacity retention compared to pure NiO nanopowders.

PAPERS

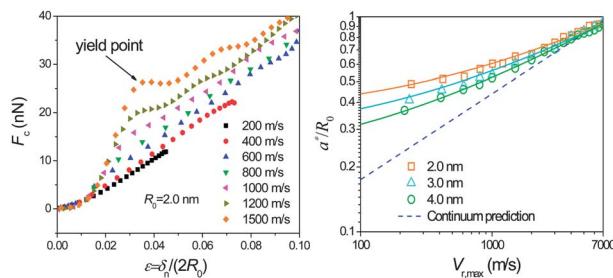
12651


The origin of off-resonance non-linear optical activity of a gold chiral nanomaterial

Nadia Abdulrahman, Christopher D. Syme, Calum Jack, Affar Karimullah, Laurence D. Barron, Nikolaj Gadegaard and Malcolm Kadodwala*

Viewing chiral plasmonic nanostructures as "metamolecules" could be useful for rationally designing substrates for optimal chiral response.

12658


The dynamic effect on mechanical contacts between nanoparticles

Weifu Sun*

The rich behaviors of high-speed mechanical contacts at the nanoscale have been studied.

ADDITIONS AND CORRECTIONS

12670

Additions and corrections for 2013