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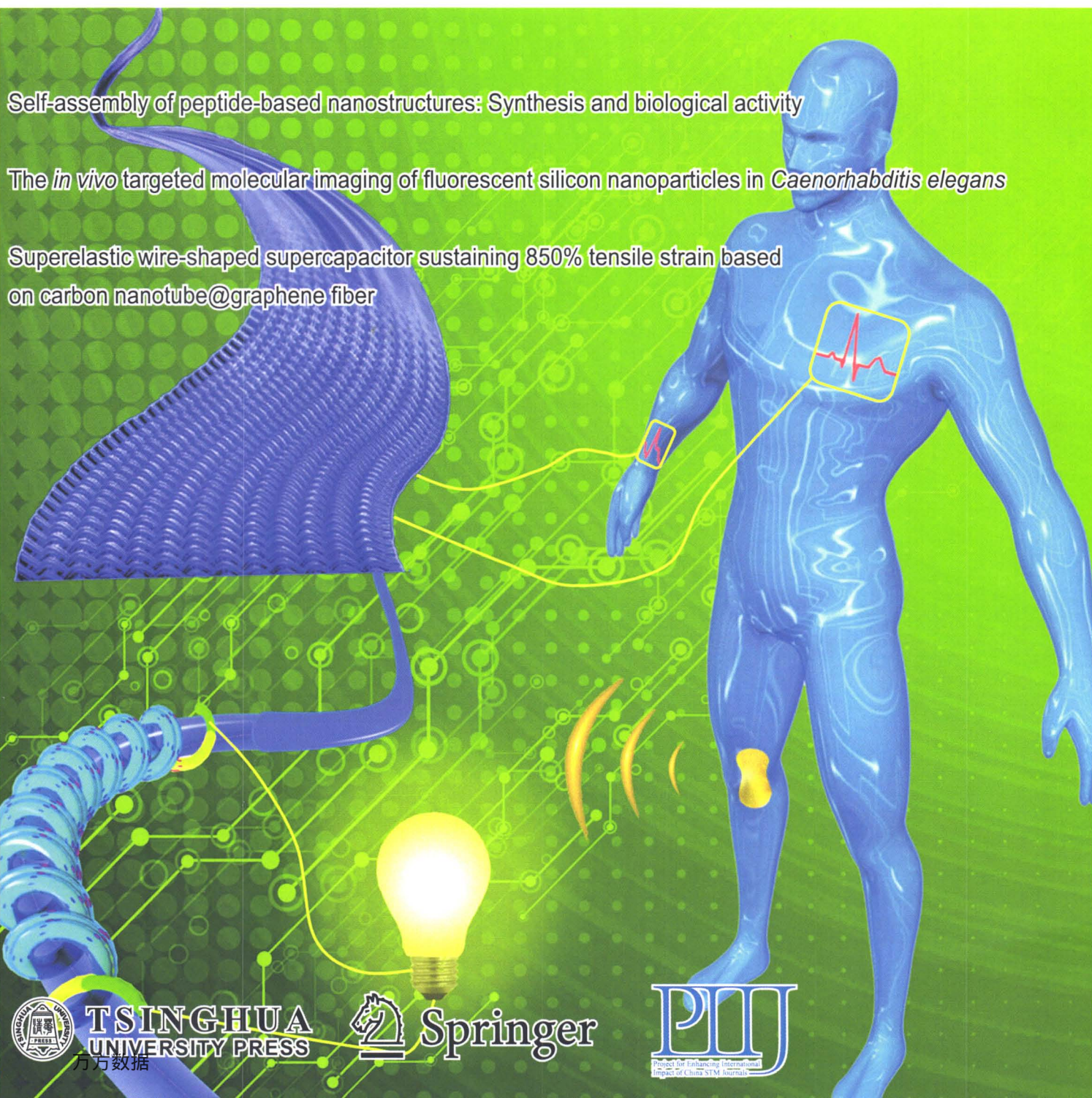


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Self-assembly of peptide-based nanostructures: Synthesis and biological activity

The *in vivo* targeted molecular imaging of fluorescent silicon nanoparticles in *Caenorhabditis elegans*

Superelastic wire-shaped supercapacitor sustaining 850% tensile strain based on carbon nanotube@graphene fiber



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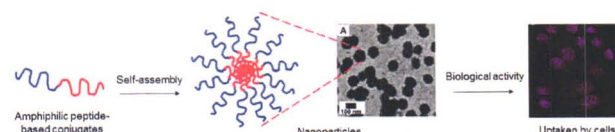
Review Article

Self-assembly of peptide-based nanostructures: Synthesis and biological activity

Léna Guyon, Elise Lepeltier*, and Catherine Passirani

UBL Université Bretagne Loire, France

2315–2335



This review explores aliphatic-chain-conjugated peptides and drug-conjugated peptides that can self-assemble. Special attention is given to the synthesis procedure, nanostructure formation, and biological activity.

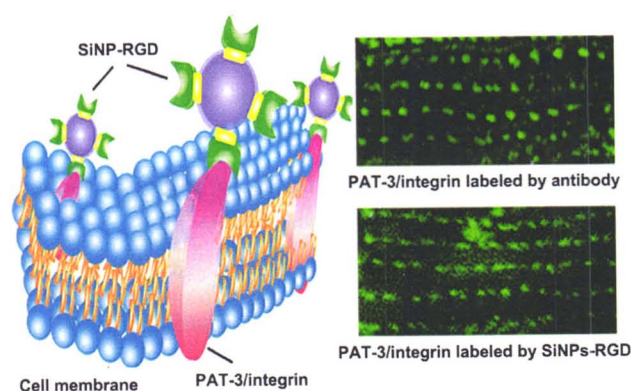
Research Articles

The *in vivo* targeted molecular imaging of fluorescent silicon nanoparticles in *Caenorhabditis elegans*

Yanfeng Zhou, Yun Zhang, Yiling Zhong, Rong Fu, Sicong Wu, Qin Wang, Houyu Wang, Yuanyuan Su, Huimin Zhang*, and Yao He*

Soochow University, China

2336–2346



Herein, we describe the use of *Caenorhabditis elegans* as an animal model to investigate the *in vivo* behavior and molecular imaging capacity of ultrasmall fluorescent silicon nanoparticles (SiNPs). The results demonstrate that the internalized SiNPs possess superior biocompatibility, chemical stability, and photostability in the live worms, ensuring faithful visualization of the distribution of subcellular structures in live organisms.

Superelastic wire-shaped supercapacitor sustaining 850% tensile strain based on carbon nanotube@graphene fiber

Huimin Wang, Chunya Wang, Muqiang Jian, Qi Wang, Kailun Xia, Zhe Yin, Mingchao Zhang, Xiaoping Liang, and Yingying Zhang*

Tsinghua University, China

2347–2356



An ultra-stretchable wire-shaped supercapacitor was fabricated by winding fibrous electrodes around an elastic core fiber. The supercapacitor can sustain tensile strain up to 850%, while maintaining a stable electrochemical performance. This study provides a universal strategy for the fabrication of highly stretchable wire-shaped devices.

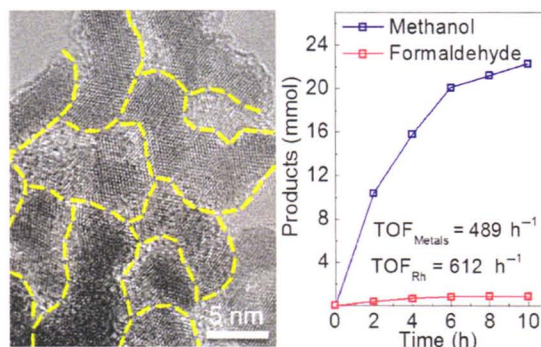
Grain boundaries modulating active sites in RhCo porous nanospheres for efficient CO₂ hydrogenation

Xusheng Zheng^{1,*}, Yue Lin¹, Haibin Pan¹, Lihui Wu¹, Wei Zhang¹, Linlin Cao¹, Jing Zhang², Lirong Zheng², and Tao Yao^{1,*}

¹ University of Science and Technology of China, China

² Institute of High Energy Physics, Chinese Academy of Sciences, China

2357–2365



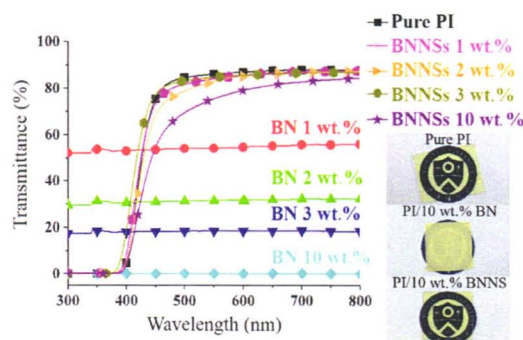
We integrated grain boundaries to modulate the active sites and electronic properties via RhCo porous nanospheres. The porous nanospherical morphology allows for a high population of grain boundaries to be accessible to the reactants, thus providing sufficient active sites for the catalytic process of high-performance CO₂ hydrogenation.

Development of polyimide films reinforced with boron nitride and boron nitride nanosheets for transparent flexible device applications

You Jin Min, Kyeong-Hee Kang, and Dae-Eun Kim*

Yonsei University, Republic of Korea

2366–2378



We prepared polyimide (PI)-based composite films with boron nitride (BN) and boron nitride nanosheets (BNNs) to enhance the thermal and mechanical properties of polyimide for flexible device applications. PI/BNNs composite films exhibited excellent properties, better than those of PI/BN composite films, and PI/2 wt.% BNNs was determined to be the optimum composition.

Surface-floating gold nanorod super-aggregates with macroscopic uniformity

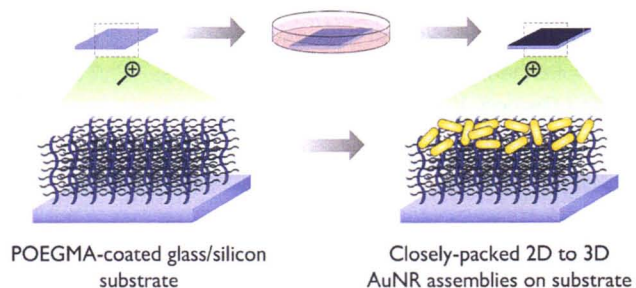
Abdul R. Ferhan¹, Youju Huang¹, Anirban Dandapat¹, and Dong-Hwan Kim^{2,*}

¹ Nanyang Technological University, Singapore

² Sungkyunkwan University, Republic of Korea

2379–2391

Immersion of POEGMA-coated glass/
silicon substrate in AuNR solution



High-density three-dimensional assemblies of gold nanorods on polymer brush was obtained with macroscopic uniformity via single-step immersion of polymer brush-coated substrates in gold nanorod solution without any form of functionalization.

Polycation-functionalized gold nanodots with tunable near-infrared fluorescence for simultaneous gene delivery and cell imaging

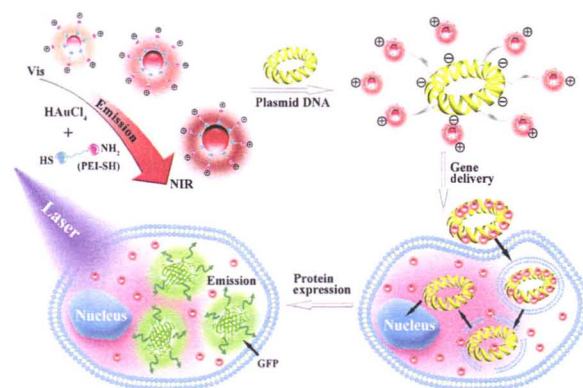
Yuanqing Sun^{1,3}, Dandan Wang¹, Yueqi Zhao¹, Tianxin Zhao¹, Hongchen Sun¹, Xiangwei Li¹, Chuanxi Wang^{2,*}, Bai Yang¹, and Quan Lin^{1,*}

¹ Jilin University, China

² Ningbo Institute of Industrial Technology, Chinese Academy of Sciences, China

³ China University of Petroleum, China

2392–2404



Polycation-functionalized gold nanodots with tunable fluorescence from the visible to near-infrared region as well as high quantum yield, good fluorescence stability, and low cytotoxicity can realize gene delivery and cell imaging simultaneously.

Single Cr atom catalytic growth of graphene

Huy Q. Ta^{1,2}, Liang Zhao¹, Wanjian Yin^{1,*}, Darius Pohl³, Bernd Rellinghaus³, Thomas Gemming³, Barbara Trzebicka², Justinas Palisaitis⁴, Gao Jing¹, Per O. Å. Persson⁴, Zhongfan Liu^{1,5}, Alicja Bachmatiuk^{1,2,3,*}, and Mark H. Rümmeli^{1,2,3,*}

¹ Soochow University, China

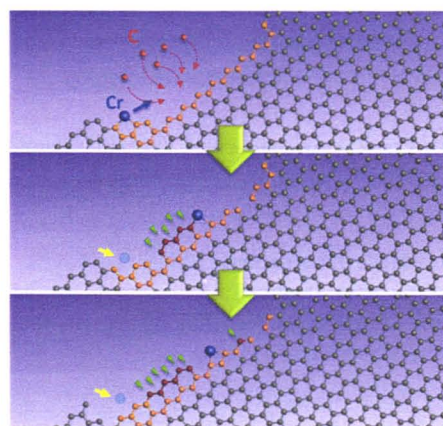
² Polish Academy of Sciences, Poland

³ IFW Dresden, Germany

⁴ Linköping University, Sweden

⁵ Peking University, China

2405–2411



Direct observations of the behavior of single Cr atoms in graphene mono- and divacancies and, more importantly, at graphene edges under electron beam irradiation, show a single Cr atom diffusing along the edge and catalytically growing new graphene.

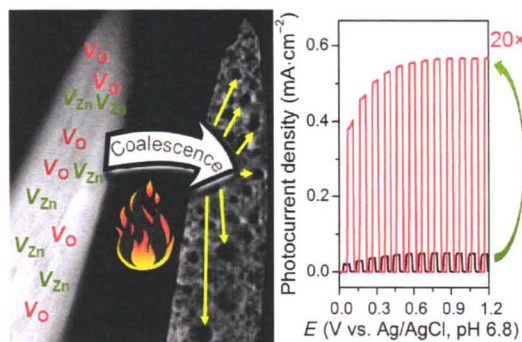
Elucidation of thermally induced internal porosity in zinc oxide nanorods

Albertus D. Handoko^{1,*}, Laura-Lynn Liew^{1,2}, Ming Lin¹, Gopinathan Sankar³, Yonghua Du¹, Haibin Su², Zhili Dong², and Gregory K. L. Goh^{1,2,*}

¹ Agency for Science, Technology and Research (A*STAR), Singapore

² Nanyang Technological University, Singapore

³ University College London, UK



The formation of internal pores in ZnO nanorods was tracked using *in situ* tomography techniques. A 20× higher photocurrent was obtained since the lowered defect density and formation of internal pores improved light absorption.

2412–2423

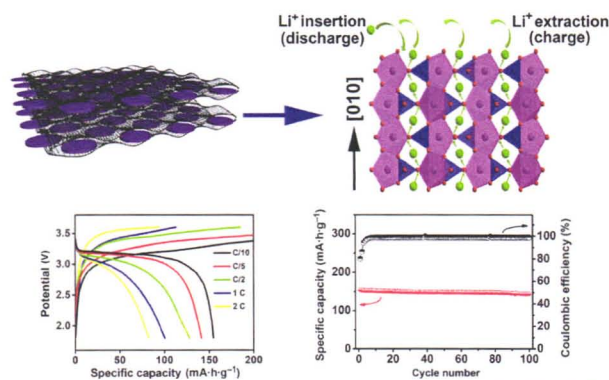
Highly [010]-oriented self-assembled LiCoPO₄/C nanoflakes as high-performance cathode for lithium ion batteries

Yan Hou¹, Kun Chang^{2,*}, Bao Li¹, Hongwei Tang¹, Zhenyu Wang³, Jianli Zou³, Huimin Yuan³, Zhouguang Lu^{3,*}, and Zhaorong Chang^{1,*}

¹ Henan Normal University, China

² National Institute for Materials Science (NIMS), Japan

³ Southern University of Science and Technology, China



LiCoPO₄/C nanoflakes are obtained by the self-assembly of LiCoPO₄ nanoplates along the [010] direction to form stable microparticles. High capacities (154.6 mA·h·g⁻¹ at 0.1 C (based on the LiCoPO₄ weight of 1 C = 167 mA·h·g⁻¹)) and stable cycling (93.1% capacity retention after 100 cycles) are achieved in the full cell.

2424–2435

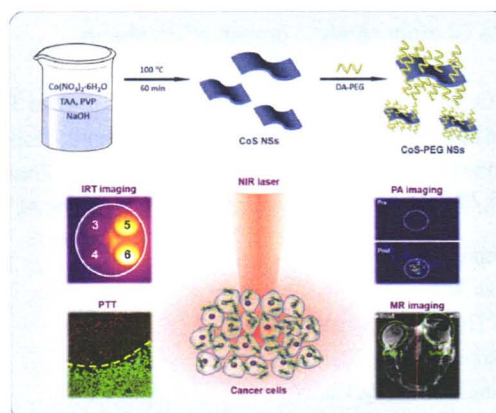
Polyethylene glycol-modified cobalt sulfide nanosheets for high-performance photothermal conversion and photoacoustic/magnetic resonance imaging

Zhenglin Li^{1,2}, Zhuo Li¹, Lei Chen³, Ying Hu¹, Shaoshan Hu³, Zhaohua Miao¹, Ye Sun^{1,*}, Flemming Besenbacher^{2,*}, and Miao Yu^{1,*}

¹ Harbin Institute of Technology, China

² Aarhus University, Denmark

³ The Second Affiliated Hospital of the Harbin Medical University, China



Polyethylene glycol (PEG)-modified cobalt sulfide nanosheets (CoS-PEG NSs) are synthesized and utilized for the first time as a biocompatible and powerful theranostic nanoagent for efficient photothermal conversion and multimodal imaging. Such novel theranostic nanoplateforms have great potential for precise/efficient cancer diagnosis and therapy.

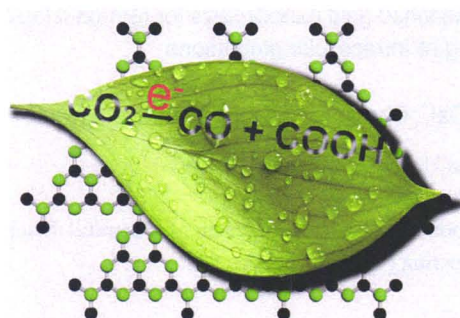
2436–2449

Polarized few-layer g-C₃N₄ as metal-free electrocatalyst for highly efficient reduction of CO₂

Bing Zhang, Tian-Jian Zhao, Wei-Jie Feng, Yong-Xing Liu, Hong-Hui Wang, Hui Su, Li-Bing Lv, Xin-Hao Li*, and Jie-Sheng Chen*

Shanghai Jiao Tong University, China

2450–2459



Polarized few-layer graphitic carbon nitride (g-C₃N₄) was investigated for use as an efficient electrocatalyst for selective CO₂ reduction. The polarized surface of two-dimensional polarized g-C₃N₄ (2D-pg-C₃N₄), with a more reductive conduction band originating from the ultralow thickness (~1 nm), exhibited excellent electrochemical activity for CO₂ reduction, achieving a Faradaic efficiency of 91% at approximately -1.1 V vs. Ag/AgCl in KHCO₃ solution by selectively reducing CO₂ to CO (~80%) and formic acid (~11%).

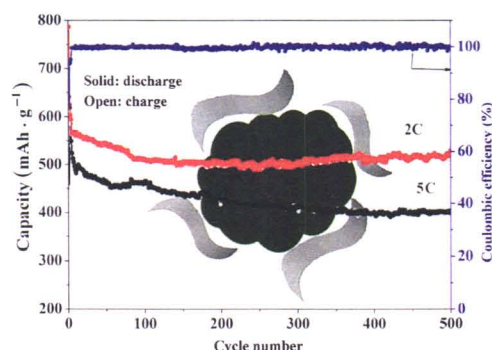
Polyaniline-coated selenium/carbon composites encapsulated in graphene as efficient cathodes for Li-Se batteries

Biwu Wang¹, Jingjing Zhang^{1,*}, Zhigang Xia^{1,*}, Meiqiang Fan¹, Chunju Lv¹, Guanglei Tian¹, and Xiaona Li²

¹ China Jiliang University (CJLU), China

² University of Science and Technology of China, China

2460–2469



A polyaniline-coated selenium/carbon nanocomposite encapsulated in graphene sheets (PANI@Se/C-G) displays excellent electrochemical performance in Li-Se batteries.

Doxorubicin-loaded Fe₃O₄@MoS₂-PEG-2DG nanocubes as a theranostic platform for magnetic resonance imaging-guided chemo-photothermal therapy of breast cancer

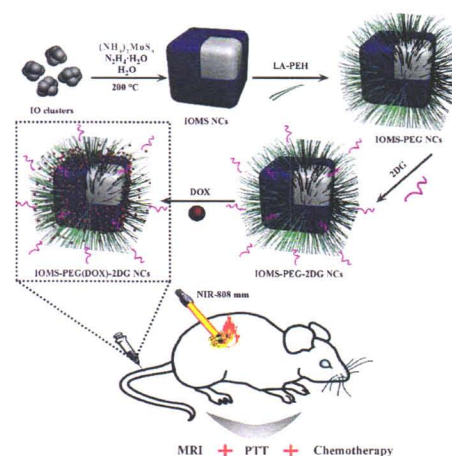
Wensheng Xie¹, Qin Gao¹, Dan Wang¹, Zhenhu Guo¹, Fei Gao², Xiumei Wang¹, Qiang Cai¹, Si-shen Feng², Haiming Fan^{3,*}, Xiaodan Sun^{1,*}, and Lingyun Zhao^{1,*}

¹ Tsinghua University, China

² National University of Singapore, Singapore

³ Northwest University, China

2470–2487



Our study highlights an excellent theranostic platform (IOMS-PEG(DOX)-2DG NCs) with a great potential for targeted magnetic resonance imaging (MRI)-guided precise chemo-photothermal therapy of breast cancer.

Self-quenched gold nanoclusters for turn-on fluorescence imaging of intracellular glutathione

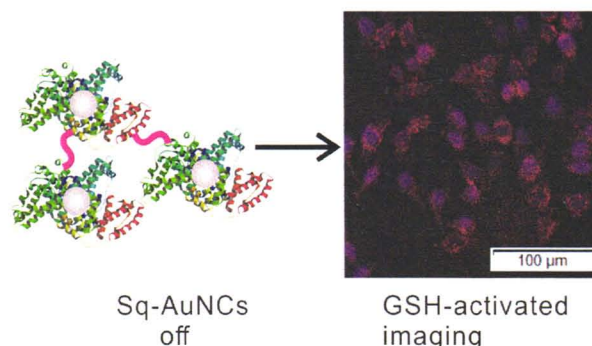
Cong Dai¹, Chengxiong Yang¹, and Xiuping Yan^{1,2,3,*}

¹ Nankai University, China

² Jiangnan University, China

³ Collaborative Innovation Center of Chemical Science and Engineering (Tianjin), China

2488–2497



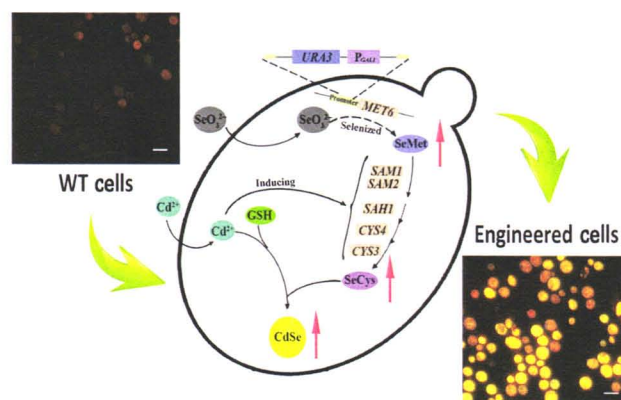
Self-quenched gold nanoclusters (Sq-AuNCs) were prepared via disulfide bond induced aggregation of gold nanoclusters for turn-on fluorescence imaging of intracellular glutathione.

Living cell synthesis of CdSe quantum dots: Manipulation based on the transformation mechanism of intracellular Se-precursors

Ming Shao, Rong Zhang, Chuan Wang, Bin Hu, Daiwen Pang, and Zhixiong Xie*

Wuhan University, China

2498–2511



Manipulation of cadmium-selenium quantum dot (CdSe QD) biosynthesis: Modification of selenium metabolism, based on the role of the SeMet-to-SeCys pathway in CdSe QD biosynthesis, contributes to a higher yield of CdSe QDs in engineered yeast cells.

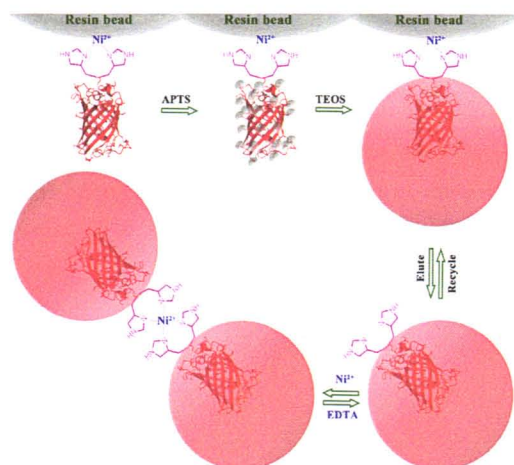
Silica nanoparticle with a single His-tag for addressable functionalization, reversible assembly, and recycling

Yuye Cao¹, Yangdong Cui¹, Yu Yang¹, Jie Hua¹, Zheng-Mei Song¹, Haifang Wang¹, Yuanfang Liu^{1,2}, and Aoneng Cao^{1,*}

¹ Shanghai University, China

² Peking University, China

2512–2522



His-tagged proteins are individually encapsulated in silica nanoparticles (NPs) in the same orientation, leaving a single His-tag outside each NP for reversible dimerization and recycling.

InP/GaInP nanowire tunnel diodes

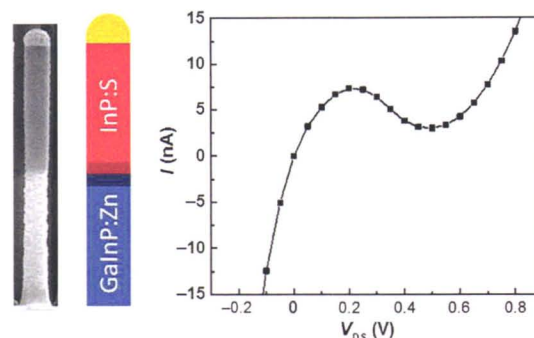
Xulu Zeng^{1,*}, Gaute Otnes¹, Magnus Heurlin^{1,†}, Renato T Mourão², and Magnus T Borgström¹

¹ Lund University, Sweden

² Universidade Federal do Rio de Janeiro, Brazil

[†] Present address: Sol Voltaics AB, Sweden

2523–2531



We report the first InP/GaInP nanowire tunnel diodes in both InP/GaInP and GaInP/InP configurations. The realization of the nanowire tunnel diodes opens up opportunities for the design of nanowire tandem solar cells independent of the growth order of the different materials, increasing the flexibility regarding dopant incorporation polarity.

Strong contact coupling of neuronal growth cones with height-controlled vertical silicon nanocolumns

Seong-Min Kim¹, Seyeong Lee¹, Dongyoon Kim¹, Dong-Hee Kang¹, Kisuk Yang², Seung-Woo Cho², Jin Seok Lee³, Insung S. Choi^{4,*}, Kyungtae Kang^{5,*}, and Myung-Han Yoon^{1,*}

¹ Gwangju Institute of Science and Technology, Republic of Korea

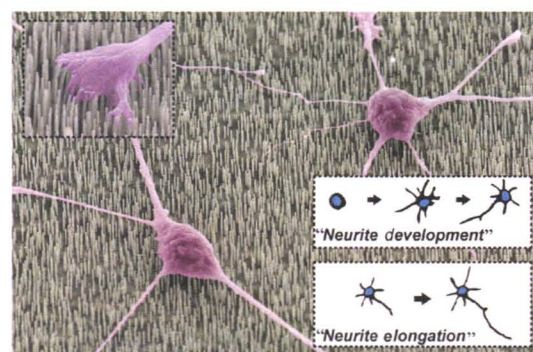
² Yonsei University, Republic of Korea

³ Sookmyung Women's University, Republic of Korea

⁴ KAIST, Republic of Korea

⁵ Kyung Hee University, Republic of Korea

2532–2543



Height-controlled vertically etched silicon nanocolumn arrays (vSNAs) accelerated *in vitro* neurite development by engaging strong cone-to-substrate coupling. Furthermore, neurite polarization and elongation were differentially modulated depending on the height of the nanocolumns.

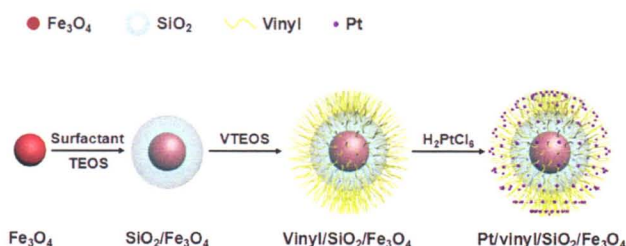
Heterogeneously supported pseudo-single atom Pt as sustainable hydrosilylation catalyst

Huachao Zai^{1,2}, Yizhou Zhao^{1,2}, Shanyu Chen¹, Lei Ge¹, Changfeng Chen^{1,*}, Qi Chen², and Yujing Li^{1,2,*}

¹ China University of Petroleum, China

² Beijing Institute of Technology, China

2544–2552



Superparamagnetic $\text{Fe}_3\text{O}_4/\text{SiO}_2$ core-shell nanoparticles are prepared as the substrate for pseudo-single atom Pt catalysts; the $\text{Fe}_3\text{O}_4/\text{SiO}_2$ -supported Pt displays high activity as a reusable heterogeneous catalyst for the hydrosilylation reaction.

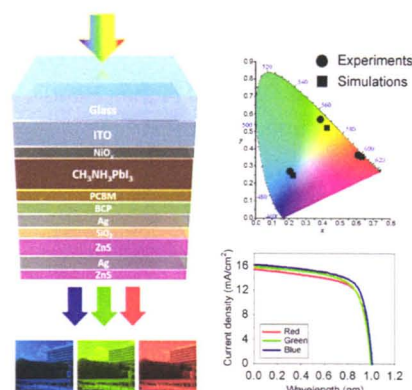
High-performance colorful semitransparent perovskite solar cells with phase-compensated microcavities

Kyu-Tae Lee¹, Ji-Yun Jang², Na Young Ha², Soonil Lee², and Hui Joon Park^{2,*}

¹ University of Illinois, USA

² Ajou University, Republic of Korea

2553–2561



We present high-performance multiple-color-producing semitransparent perovskite solar cells exploiting optical microcavities, incorporated with a phase-compensating functional medium that provides not only a better impedance matching to enhance the transmittance but an extra reflection phase change to improve angle-dependent properties with a negligible change in both color vibrancy and electrical characteristics.

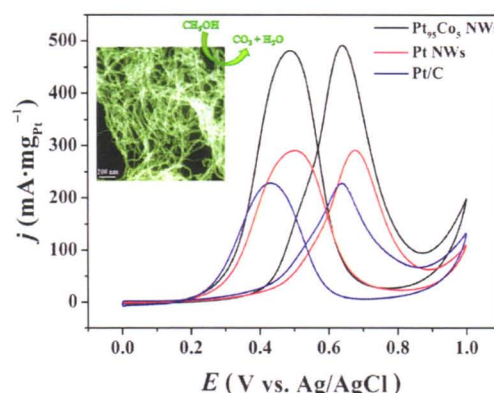
One-pot synthesis of interconnected Pt₉₅Co₅ nanowires with enhanced electrocatalytic performance for methanol oxidation reaction

Qingqing Lu^{1,2}, Litai Sun^{1,2}, Xue Zhao^{1,2}, Jianshe Huang¹, Ce Han¹, and Xiurong Yang^{1,*}

¹ Changchun Institute of Applied Chemistry, Chinese Academy of Sciences, China

² University of Chinese Academy of Sciences, China

2562–2572



Interconnected Pt₉₅Co₅ nanowires that integrate the merits of wire-like structure and bimetallic composition were synthesized through a one-pot surfactant-free method and applied as effective electrocatalysts for the methanol oxidation reaction.

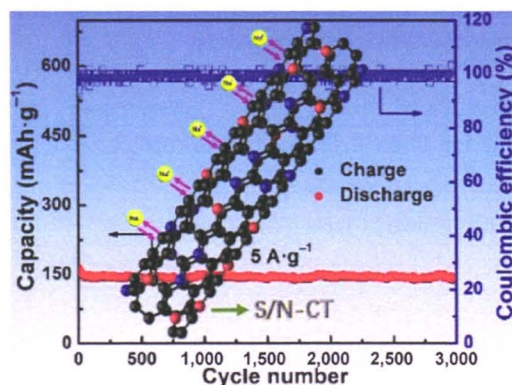
Conjugated polymer-mediated synthesis of sulfur- and nitrogen-doped carbon nanotubes as efficient anode materials for sodium ion batteries

Yanzhen He¹, Xijiang Han^{1,*}, Yunchen Du¹, Bo Song¹, Bin Zhang¹, Wei Zhang^{2,*}, and Ping Xu^{1,*}

¹ Harbin Institute of Technology, China

² Chongqing Institute of Green and Intelligent Technology, Chinese Academy of Sciences, China

2573–2585



Highly active sulfur and nitrogen co-doped carbon nanotubes (S/N-CT) derived from polyaniline (PANI) nanotubes are demonstrated as efficient anode materials for sodium ion batteries with high rate capability and long cycling life.

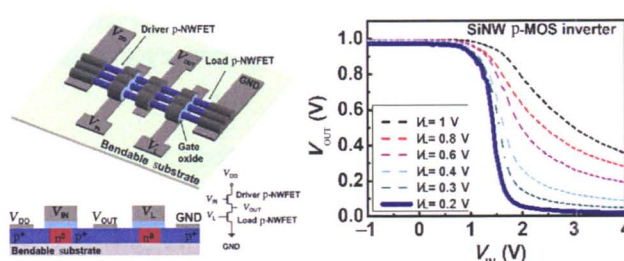
Silicon nanowire ratioed inverters on bendable substrates

Jeongje Moon^{1,2}, Yoonjoong Kim¹, Doohyeok Lim¹,
Kyeungmin Im¹, and Sangsig Kim^{1,*}

¹ Korea University, Republic of Korea

² Samsung Electronics Co., Ltd., Republic of Korea

2586–2591



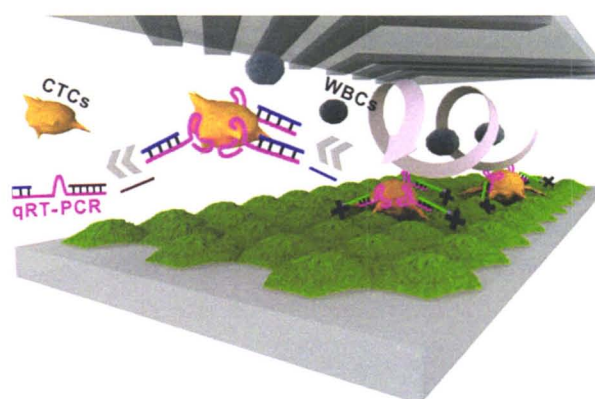
We demonstrate the performance of a silicon nanowire (SiNW) n-metal oxide semiconductor (MOS) and p-MOS ratioed inverters on bendable substrates. The electrical characteristics of the fabricated devices can be controlled by adjusting the load voltage.

Programmable DNA-responsive microchip for the capture and release of circulating tumor cells by nucleic acid hybridization

Shan Guo, Haiyan Huang, Xujing Deng, Yuqi Chen,
Zhuoran Jiang, Min Xie, Songmei Liu, Weihua Huang*,
and Xiang Zhou*

Wuhan University, China

2592–2604



In this study, we developed a programmable DNA-responsive microchip integrated with a hierarchical nanostructure for highly efficient capture, nondestructive release, and detection of protein biomarkers of circulating tumor cells.

Unraveling giant Cu(110) surface restructuring induced by a non-planar phthalocyanine

Nataliya Kalashnyk^{1,*}, Luke A. Rochford², Dongzhe Li³,
Alexander Smogunov⁴, Yannick J. Dappe⁴, Tim S. Jones²,
and Laurent Guillemot¹

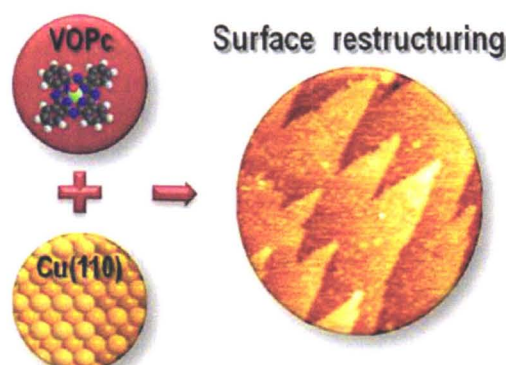
¹ Université Paris-Sud 11, France

² The University of Birmingham, UK

³ University of Konstanz, Germany

⁴ Université Paris-Saclay, France

2605–2611



A drastic reorganization of a copper surface, commonly used as an electrode material for functional electronic devices incorporating organic semiconductors, was discovered upon adsorption of vanadyl phthalocyanine (VOPc) molecules. The thermal stability of the VOPc/Cu(110) interface was tested and the enhancements in the “sculpting” of the copper crystal by the VOPc adsorbate were clearly demonstrated.

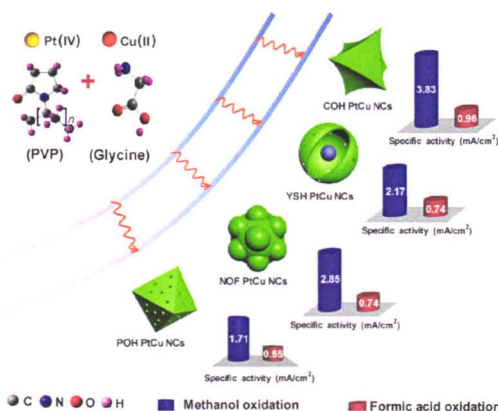
One-pot synthesis of Pt Cu bimetallic nanocrystals with different structures and their enhanced electrocatalytic properties

Daowei Gao¹, Shuna Li¹, Guolong Song¹, Pengfei Zha², Cuncheng Li¹, Qin Wei¹, Yipin Lv¹, and Guozhu Chen^{1,*}

¹ University of Jinan, China

² China University of Petroleum, China

2612–2624



A series of Pt–Cu alloy nanocrystals with concave octahedron, porous octahedron, yolk–shell, and nanoflower structures were fabricated by altering the sequential reduction kinetics by a one-pot aqueous phase synthesis. These exhibit excellent catalytic performances in the electrooxidation of methanol and formic acid.

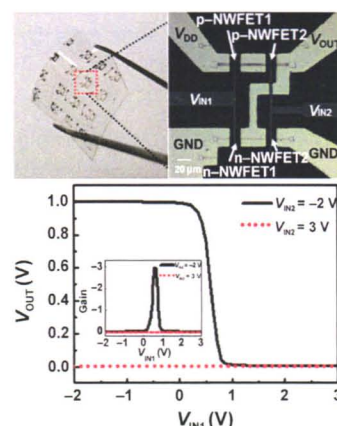
Silicon nanowire CMOS NOR logic gates featuring onevolt operation on bendable substrates

Jeongje Moon^{1,2}, Yoonjoong Kim¹, Doohyeok Lim¹, and Sangsig Kim^{1,*}

¹ Korea University, Republic of Korea

² Samsung Electronics Co. Ltd., Republic of Korea

2625–2631



We propose complementary metal-oxide-semiconductor (CMOS) NOR logic gates consisting of silicon nanowire (NW) arrays on bendable substrates. The proposed device exhibits the exact NOR functionality with high performance at a low supply voltage of 1 V.

Antarctic thermolabile uracil-DNA-glycosylase-supplemented multiple cross displacement amplification using a label-based nanoparticle lateral flow biosensor for the simultaneous detection of nucleic acid sequences and elimination of carryover contamination

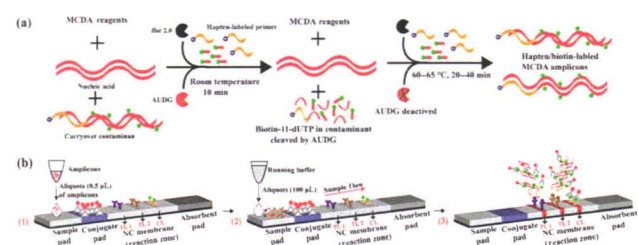
Yi Wang¹, Hui Li², Yan Wang¹, Huaqing Xu³, Jianguo Xu¹, and Changyun Ye^{1,*}

¹ Chinese Center for Disease Control and Prevention, China

² Guizhou Medical University, China

³ The Sixth People's Hospital of Zhengzhou, China

2632–2647



The Antarctic thermolabile uracil-DNA-glycosylase (AUDG)-supplemented nucleic acid amplification techniques (NAAs) using a label-based nanoparticle lateral flow biosensor (LFB) (AUDG-NAAs-LFB) technique merges enzymatic digestion of contaminants and multiple cross displacement amplification with a lateral flow biosensor for the rapid and visual detection of nucleic acid sequences. This technique can effectively eliminate and prevent the occurrence of false-positives arising from carryover contamination, primer-dimers, and the environment.

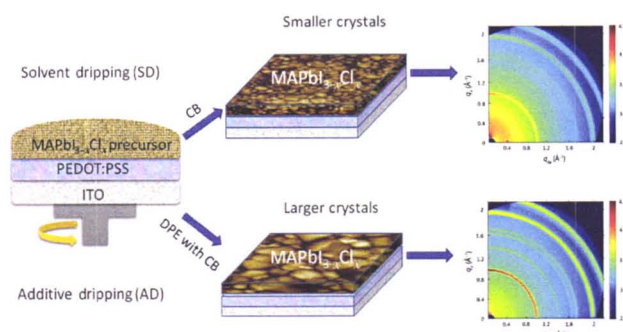
An additive dripping technique using diphenyl ether fortuning perovskite crystallization for high-efficiency solar cells

Di Huang^{1,2}, Tenghooi Goh², Yifan Zheng², Zilun Qin¹, Jiao Zhao¹, Suling Zhao¹, Zheng Xu^{1,*}, and André D. Taylor^{2,*}

¹ Beijing Jiaotong University, China

² Yale University, USA

2648–2657



We achieve uniform, pinhole-free perovskite films with improved crystallinity and larger grain size by additive dripping with diphenyl ether. This technique can significantly improve the power conversion efficiency by 15% up to 16.64%.

High-performance sub-10-nm monolayer black phosphorene tunneling transistors

Hong Li^{1,*}, Jun Tie¹, Jingzhen Li², Meng Ye², Han Zhang², Xiuying Zhang², Yuanyuan Pan², Yangang Wang⁵, Ruge Quhe⁶, Feng Pan^{4,*}, and Jing Lu^{2,3,*}

¹ North China University of Technology, China

² Peking University, China

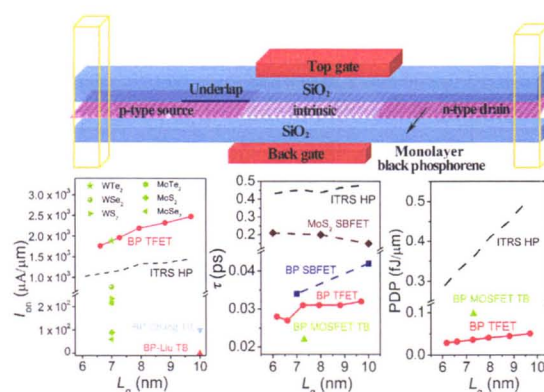
³ Collaborative Innovation Center of Quantum Matter, China

⁴ Shenzhen Graduate School, China

⁵ China Academy of Space Technology, China

⁶ Beijing University of Posts and Telecommunications, China

2658–2668



We predict that the on-state current, delay time, and power dissipation of monolayer black phosphorene tunneling transistors surpass the requirements of the International Technology Roadmap for Semiconductors for high-performance devices in the 6–10 nm scale using *ab initio* quantum transport calculations.

Efficient fully laser-patterned flexible perovskite modules and solar cells based on low-temperature solution-processed SnO₂/mesoporous-TiO₂ electron transport layers

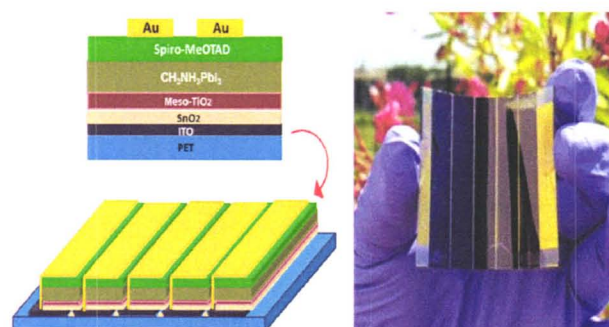
Janardan Dagar¹, Sergio Castro-Hermosa¹, Matteo Gasbarri¹, Alessandro L. Palma¹, Lucio Cina², Fabio Matteocci¹, Emanuele Calabrò¹, Aldo Di Carlo^{1,3}, and Thomas M. Brown^{1,*}

¹ University of Rome Tor Vergata, Italy

² Cicci Research srl, Italy

³ National University of Science and Technology "MISiS", Russia

2669–2681



Flexible perovskite solar cells and laser-patterned modules with polyethylene terephthalate (PET)/indium tin oxide (ITO)/SnO₂/mesoporous-TiO₂ (meso-TiO₂)/CH₃NH₃PbI₃/2,2',7,7'-tetrakis-(N,N-di-p-methoxyphenylamine)-9,9'-spirobifluorene (Spiro-MeOTAD)/Au architecture fabricated at low temperature using solution processed methods delivered a maximum power conversion efficiency of 14.8% and 8.8% respectively under 1 sun illumination. State of the art solar cell maximum power densities of 19.2 $\mu\text{W}/\text{cm}^2$ (estimated efficiency of 13.3%) at 400 lx under indoor LED light illumination were also reached.

Nanocapsules of oxalate oxidase for hyperoxaluria treatment

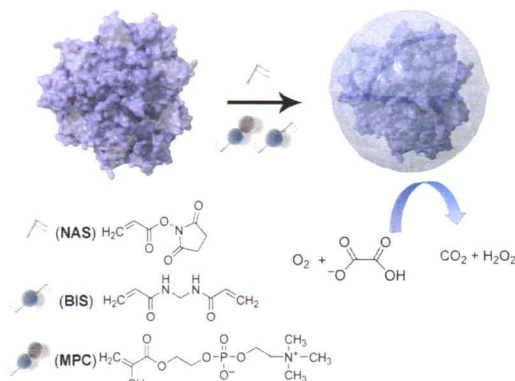
Ming Zhao¹, Duo Xu¹, Di Wu¹, James W. Whittaker², Robert Terkeltaub³, and Yunfeng Lu^{1,*}

¹ University of California, Los Angeles, USA

² Oregon Health and Sciences University, USA

³ San Diego VA Medical Center, USA

2682–2688



A novel delivery strategy of oxalate oxidase (OxO) that is encapsulated within a thin zwitterionic shell is reported for the treatment of hyperoxaluria. As-formed OxO nanocapsules exhibit enhanced catalytic activity, significantly prolonged plasma circulation time, and substantially mitigated immunogenicity compared with the native OxO.

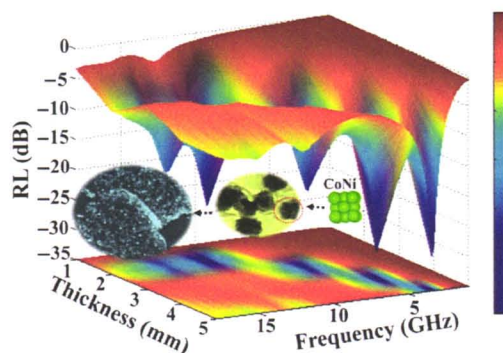
Enhanced microwave absorption performance of highly dispersed CoNi nanostructures arrayed on graphene

Genban Sun^{1,2}, Hong Wu², Qingliang Liao^{1,*}, and Yue Zhang^{1,*}

¹ University of Science and Technology Beijing, China

² Beijing Normal University, China

2689–2704



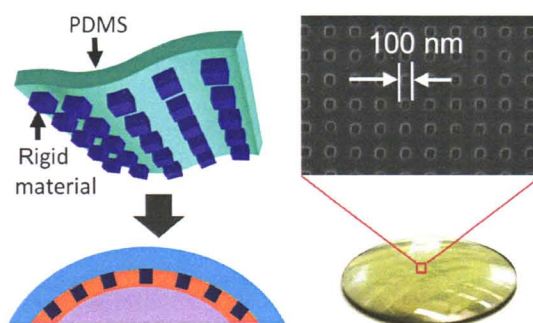
Phase- and morphology-controllable CoNi alloy nanoclusters were assembled uniformly and densely on two-dimensional graphene via a facile one-pot solution co-thermal decomposition method and exhibited excellent microwave absorptability.

Soft thermal nanoimprint lithography using a nanocomposite mold

Viraj Bhingardive, Liran Menahem, and Mark Schwartzman*

Ben-Gurion University of the Negev, Israel

2705–2714



Soft thermal nanoimprint lithography is demonstrated using a novel nanocomposite mold, which is made of flexible polydimethylsiloxane (PDMS) substrate with chemically attached rigid relief features. The applications of the nanocomposite mold included a high-resolution nanopatterns with sub-100 nm features thermally imprinted on non-planar surfaces, such as lenses.

Rod-shaped thiocyanate-induced abnormal band gap broadening in SCN^- doped CsPbBr_3 perovskite nanocrystals

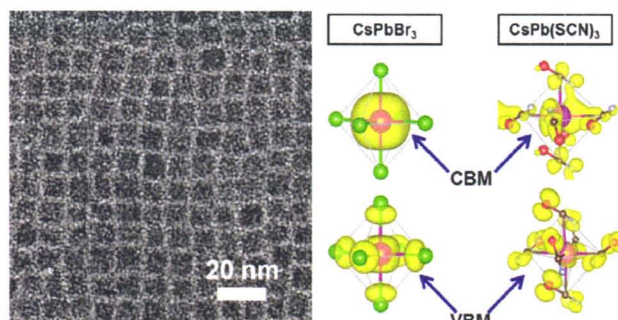
Yongbing Lou^{1,*}, Yandan Niu¹, Dongwen Yang², Qiaoling Xu², Yuhang Hu¹, Ying Shen¹, Jing Ming¹, Jinxi Chen¹, Lijun Zhang^{2,*}, and Yixin Zhao^{3,*}

¹ Southeast University, China

² Jilin University, China

³ Shanghai Jiao Tong University, China

2715–2723



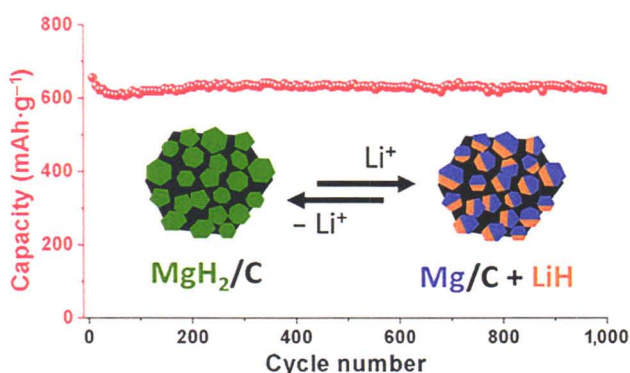
A combined experimental and theoretical investigation of SCN^- doped CsPbBr_3 nanocrystals revealed that SCN^- doping is an effective approach to modify the electronic structure, particularly the conduction band position, of halide perovskite nanocrystals.

Plasma-processed homogeneous magnesium hydride/carbon nanocomposites for highly stable lithium storage

Xinghua Chang, Xinyao Zheng, Yanru Guo, Jun Chen, Jie Zheng*, and Xingguo Li*

Peking University, China

2724–2732



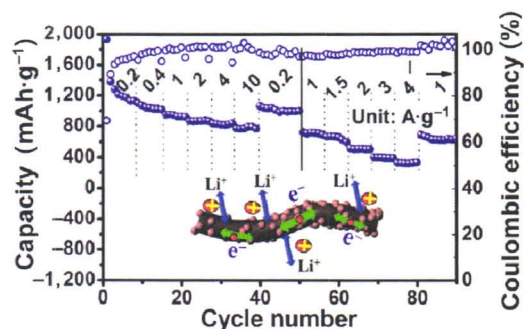
Magnesium hydride nanocrystals homogeneously distributed in carbon, obtained by thermal plasma processing, exhibit high capacity and excellent stability in lithium storage applications. These materials retain a reversible capacity of $620 \text{ mAh}\cdot\text{g}^{-1}$ after 1,000 cycles, which represents a significant improvement in the performance of magnesium hydride-based anodes for lithium ion batteries.

Amorphous red phosphorus anchored on carbon nanotubes as high performance electrodes for lithium ion batteries

Li Sun*, Yu Zhang, Deyang Zhang, Jingang Liu, and Yihe Zhang*

China University of Geosciences, China

2733–2745



Red phosphorus-carbon nanotube (P@CNT) composites were synthesized with amorphous P nanoparticles uniformly anchored on CNTs. The composite electrodes exhibit superior electrochemical properties as anode materials for lithium ion batteries.

Deciphering active biocompatibility of iron oxide nanoparticles from their intrinsic antagonism

Lu Wang¹, Zejun Wang¹, Xiaoming Li², Yi Zhang¹, Min Yin¹, Jiang Li¹, Haiyun Song³, Jiye Shi^{1,4}, Daishun Ling⁵, Lihua Wang¹, Nan Chen^{1,*}, and Chunhai Fan^{1,2,*}

¹ Shanghai Institute of Applied Physics, Chinese Academy of Sciences, China

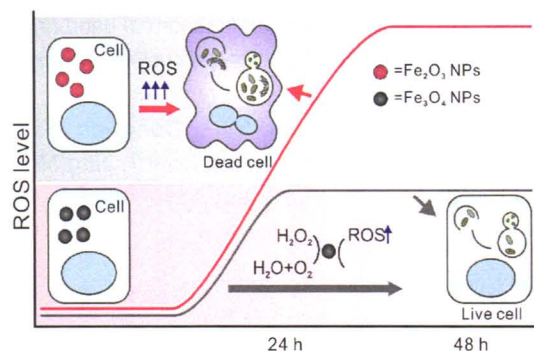
² Shanghai Tech University, China

³ Shanghai Institutes for Biological Sciences, Chinese Academy of Sciences, China

⁴ UCB Pharma, UK

⁵ Zhejiang University, China

2746–2755



Intrinsic catalase-like activity of Fe_3O_4 nanoparticles (NPs) both induced and antagonized the accumulation of toxic reactive oxygen species (ROS), and thereby modulated the extent of cellular oxidative stress, autophagic activity, and programmed cell death.

Targeted and imaging-guided *in vivo* photodynamic therapy for tumors using dual-function, aggregation-induced emission nanoparticles

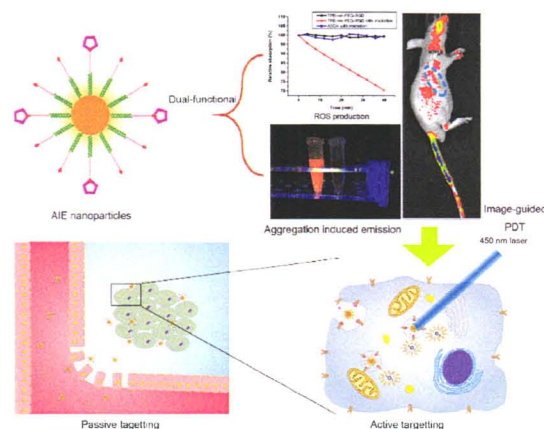
Xianhe Sun¹, Abudurehman Zebibula¹, Xiaobiao Dong², Gonghui Li^{1,*}, Guanxin Zhang^{2,*}, Deqing Zhang², Jun Qian¹, and Sailing He^{1,3,*}

¹ Zhejiang University, China

² Institute of Chemistry, Chinese Academy of Sciences, China

³ Royal Institute of Technology, Sweden

2756–2770



Dual-function nanoparticles, with the property of aggregation-induced emission (AIE) and capacity for reactive oxygen species production, were used to achieve passive/active targeting of a tumor. Good contrast of *in vivo* imaging and obvious therapeutic efficacy were observed at a low dose of AIE nanoparticles and low irradiance of light, resulting in negligible side effects.

X-ray microscopic investigation of molecular orientation in a hole carrier thin film for organic solar cells

Quentin Arnoux^{1,2,*}, Benjamin Watts³, Sufal Swaraj⁴, François Rochet^{1,4}, and Ludovic Torteche^{1,2,*}

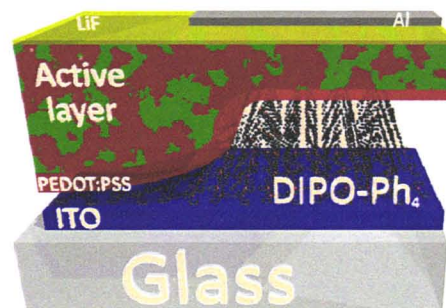
¹ UPMC Univ Paris 06, France

² NIMBE, France

³ Paul Scherrer Institute, Switzerland

⁴ L'Orme des Merisiers, France

2771–2782



In the present study, we investigate the morphology of an organic layer (2,2',6,6'-tetraphenyl-4,4'-dipyranilidene, DIPO-Ph₄) deposited under vacuum on a silicon nitride (Si_3N_4) substrate. The films were characterized by atomic force microscopy (AFM) and scanning transmission X-ray microscopy (STXM) to gain insight into the material growth.

Essential oils as solvents and core materials for the preparation of photo-responsive polymer nanocapsules

Valentina Marturano^{1,2}, Valentina Bizzarro², Adriana De Luise³, Anna Calarco³, Veronica Ambroggi^{1,*}, Marta Giamberini⁴, Bartosz Tylkowski⁵, and Pierfrancesco Cerruti²

¹ University of Naples "Federico II", Italy

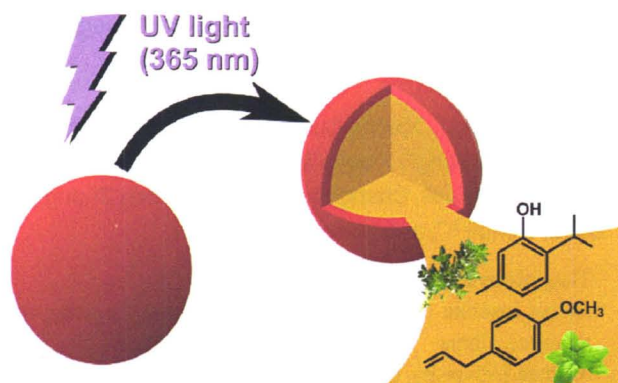
² Institute for Polymers, Composites and Biomaterials (IPCB-CNR), Italy

³ Institute of Agro-Environmental and Forest Biology (IBAF-CNR), Italy

⁴ Universitat Rovira i Virgili, Spain

⁵ Chemistry Technology Centre of Catalonia (CTQC), Spain

2783–2795



Essential oils are employed as both a solvent and as an active material in the preparation of UV-responsive nanocapsules, enabling the design of multipurpose light-triggered nanosized delivery platforms.

Porous hollow palladium nanoplatform for imaging-guided trimodal chemo-, photothermal-, and radiotherapy

Menglin Song¹, Nian Liu¹, Le He³, Gang Liu¹, Daishun Ling⁴, Xinhui Su⁵, and Xiaolian Sun^{1,2,*}

¹ Xiamen University, China

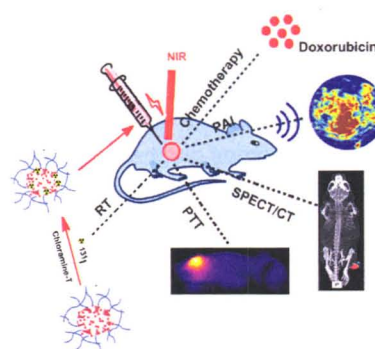
² China Pharmaceutical University, China

³ Soochow University, China

⁴ Zhejiang University, China

⁵ Zhongshan Hospital Xiamen University, China

2796–2808



Porous hollow palladium nanoparticles were developed to co-deliver ¹³¹I and doxorubicin for single-photon emission computed tomography/photoacoustic (SPECT/PA) imaging-guided trimodal chemo-, photothermal-, and radiotherapy.

In situ atomic-scale observation of monolayer graphene growth from SiC

Kaihao Yu¹, Wen Zhao^{2,4}, Xing Wu^{1,5}, Jianing Zhuang⁴, Xiaohui Hu^{1,6}, Qiubo Zhang¹, Jun Sun¹, Tao Xu¹, Yang Chai⁴, Feng Ding^{2,3,4,*}, and Litao Sun^{1,7,8,*}

¹ Southeast University, China

² Institute for Basic Science, Republic of Korea

³ Ulsan National Institute of Science and Technology, Republic of Korea

⁴ The Hong Kong Polytechnic University, Hong Kong, China

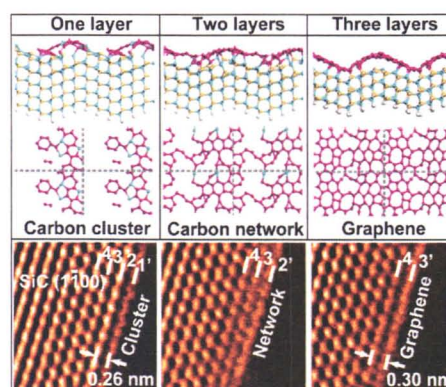
⁵ East China Normal University, China

⁶ Nanjing Tech University, China

⁷ Southeast University and Jiangnan Graphene Research Institute, China

⁸ Joint Research Institute of Southeast University and Monash University, China

2809–2820



In situ aberration-corrected transmission electron microscopy in combination with *ab initio* molecular dynamics simulations is used to reveal the epitaxial growth dynamics of monolayer graphene. Three SiC (1100) layers decompose successively to form one graphene layer; less stable carbon clusters and a network are formed as transition structures after sublimation of the first and second layers.

Highly efficient catalytic scavenging of oxygen freeradicals with graphene-encapsulated metal nanoshields

Junying Wang¹, Xiaoju Cui^{2,3,4}, Haobo Li^{2,4}, Jianping Xiao², Jiang Yang⁶, Xiaoyu Mu¹, Haixia Liu¹, Yuan-Ming Sun⁵, Xuhui Xue⁵, Changlong Liu¹, Xiao-Dong Zhang^{1,*}, Dehui Deng^{2,3,*}, and Xinhe Bao²

¹ Tianjin University, China

² Dalian Institute of Chemical Physics, Chinese Academy of Sciences, China

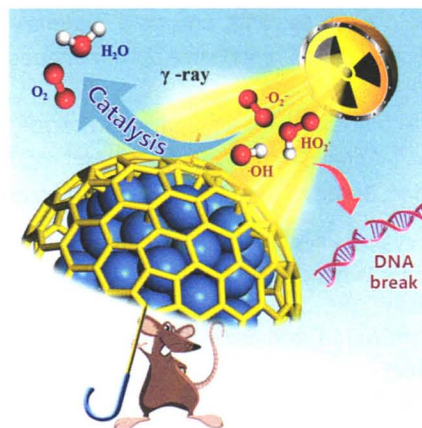
³ Xiamen University, China

⁴ University of Chinese Academy of Sciences, China

⁵ Chinese Academy of Medical Sciences and Peking Union Medical College, China

⁶ Sun Yat-sen University Cancer Center, China

2821–2835



An electrocatalytic approach based on single-layer graphene-encapsulated metal nanohybrids was shown to represent an effective strategy for developing radioprotective biomaterials. The screened nanoparticles exhibit high catalytic activity in the scavenging of oxygen radicals, leading to an overall survival rate of gamma ray-irradiated mice up to 90%, outperforming the commercial radioprotection agent amifostine.

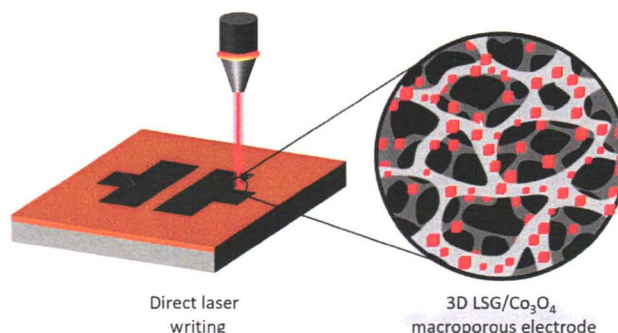
Embedding hollow Co_3O_4 nanoboxes into a three-dimensional macroporous graphene framework for high-performance energy storage devices

Mengping Li¹, Maher F. El-Kady^{1,2}, Jee Y. Hwang¹, Matthew D. Kowal¹, Kristofer Marsh¹, Haosen Wang¹, Zhijuan Zhao¹, and Richard B. Kaner^{1,*}

¹ University of California, Los Angeles, USA

² Cairo University, Egypt

2836–2846



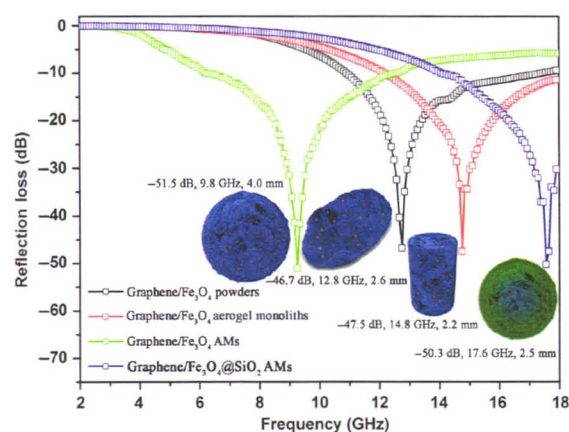
Hollow Co_3O_4 nanoboxes have been embedded into a three-dimensional macroporous laser-scribed graphene matrix to produce composite electrodes with improved electrochemical properties.

Generation of graphene-based aerogel microspheres for broadband and tunable high-performance microwave absorption by electrospinning-freeze drying process

Fanbin Meng, Huagao Wang, Wei, Zijian Chen, Tian Li, Chunyuan Li, Yu Xuan, and Zuowan Zhou*

Southwest Jiaotong University, China

2847–2861



Graphene-based aerogel microspheres showing broadband, tunable and high-performance microwave absorption have been produced on a large scale by electrospinning-freeze drying followed by calcination.

Ultra-robust triboelectric nanogenerator for harvesting rotary mechanical energy

Xinyu Du¹, Nianwu Li¹, Yuebo Liu², Jiaona Wang², Zuqing Yuan^{1,4}, Yingying Yin^{1,4}, Ran Cao^{1,4}, Shuyu Zhao², Bin Wang², Zhong Lin Wang^{1,3,4}, and Congju Li^{1,*}

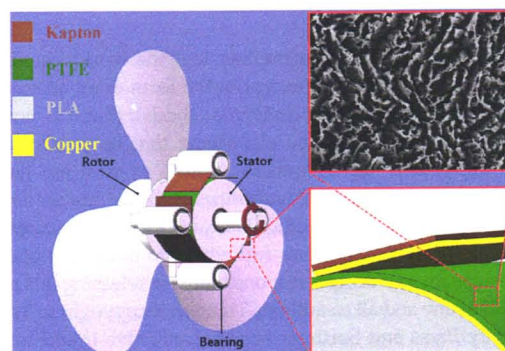
¹ National Center for Nanoscience and Technology (NCNST), China

² Beijing Institute of Fashion Technology, China

³ Georgia Institute of Technology, USA

⁴ University of Chinese Academy of Sciences, China

2862–2871



Scale-like structured triboelectric nanogenerator (SL-TENG) with outstanding robustness and long service life exhibits the feasibility as a power source for self-powered electronics and the potential for massive electricity generation.

Surface charge tunable nanoparticles for TNF- α siRNA oral delivery for treating ulcerative colitis

Shoaib Iqbal¹, Xiaojiao Du^{2,3,*}, Jilong Wang¹, Hongjun Li², Youyong Yuan^{2,3}, and Jun Wang^{2,3,4}

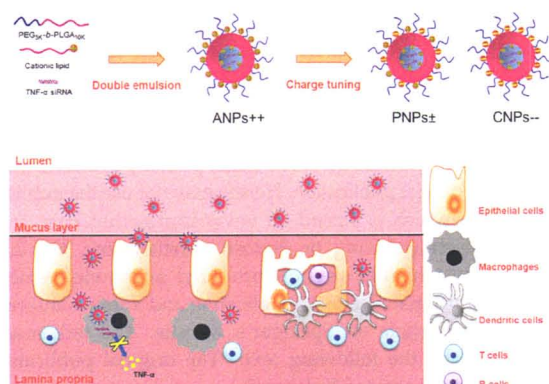
¹ University of Science and Technology of China, China

² South China University of Technology, China

³ National Engineering Research Center for Tissue Restoration and Reconstruction, China

⁴ Research Institute for Food Nutrition and Human Health, China

2872–2884



The modification of surface charge of siRNA encapsulated polymeric nanoparticles is reported here and evaluation of their *in vivo* fate against ulcerative colitis is carried out.

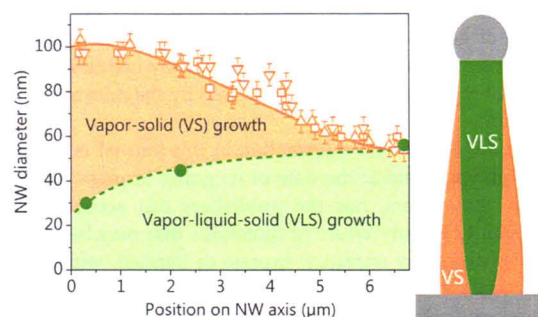
Diameter evolution of selective area grown Ga-assisted GaAs nanowires

Hanno Küpers^{1,*}, Ryan B. Lewis¹, Abbas Tahraoui¹, Mathias Matalla², Olaf Krüger², Faebian Bastiman¹, Henning Riechert¹, and Lutz Geelhaar¹

¹ Paul-Drude-Institut für Festkörperelektronik, Germany

² Leibniz-Institut für Höchstfrequenztechnik, Germany

2885–2893



Tapering of nanowires is explored and a model is built that can explain complete nanowire shape by consideration of diameter variation due to droplet size and direct radial growth on the sidewall in a consistent way.

Erratum to: Generation of graphene-based aerogel microspheres for broadband and tunable highperformance microwave absorption by electrospinningfreeze drying process (<https://doi.org/10.1007/s12274-017-1915-6>)

2894

Erratum to: Piezotronic effect on the luminescence of quantum dots for micro/nano-newton force measurement (<https://doi.org/10.1007/s12274-017-1814-x>)

2895

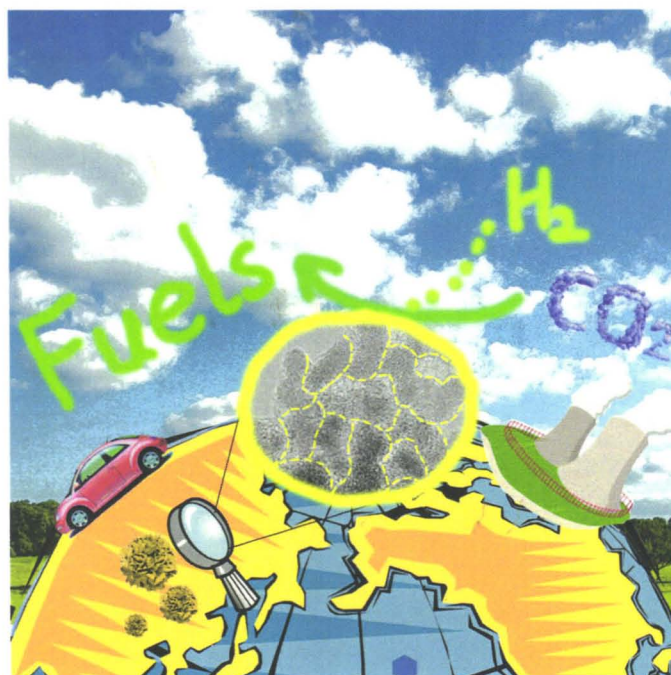
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