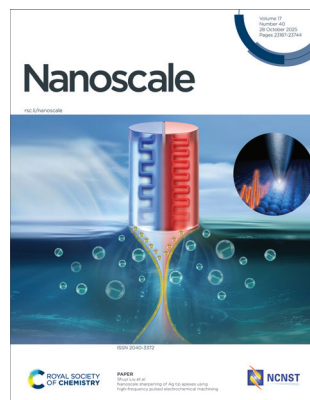


IN THIS ISSUE

ISSN 2040-3372 CODEN NANOHL 17(40) 23187–23744 (2025)



Cover

See Shuyi Liu *et al.*, pp. 23323–23328.

Image reproduced by permission of Professor Shuyi Liu's Group from *Nanoscale*, 2025, **17**, 23323.



Inside cover

See Eun-Kyung Lim, Seungjoo Haam *et al.*, pp. 23329–23342.

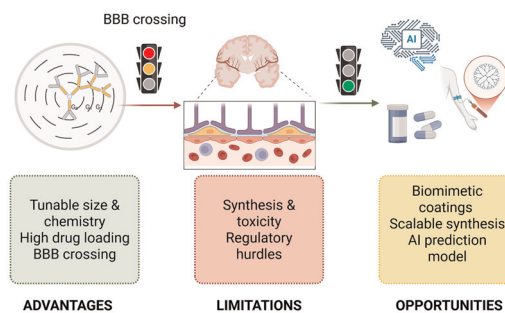
Image reproduced by permission of Seungjoo Haam and Eun-Kyung Lim from *Nanoscale*, 2025, **17**, 23329.

REVIEWS

23202

Crossing the blood–brain barrier: advances in dendrimer-based nanocarriers for central nervous system delivery

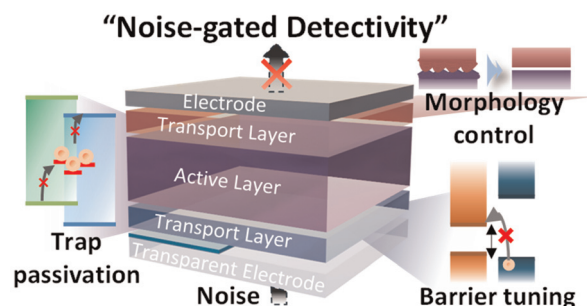
Priyanshu Bharadwaj, V. Gaëlle Roullin* and Jeanne Leblond Chain*



23228

Specific detectivity-oriented low-noise management in organic photodetectors

Seungjae Hong, Tae Hyuk Kim, Seunghyun Oh and Jae Won Shim*



Advance your career in science

with professional recognition that showcases
your **experience, expertise and dedication**

Stand out from the crowd

Prove your commitment
to attaining excellence in
your field

Gain the recognition you deserve

Achieve a professional
qualification that inspires
confidence and trust

Unlock your career potential

Apply for our professional
registers (RSci, RSciTech)
or chartered status
(CChem, CSci, CEnv)

Apply now

rsc.li/professional-development

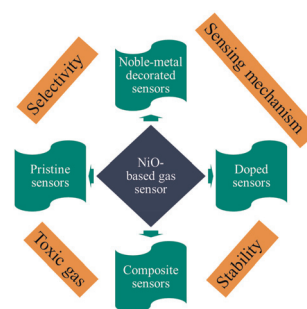


REVIEWS

23247

Recent progress in nickel oxide-based chemiresistive toxic-gas sensors

Ankur Gupta, Hyoun Woo Kim,* Sang Sub Kim,*
Ali Mirzai, Santosha K. Dwivedy and
Ravindra Kumar Jha*

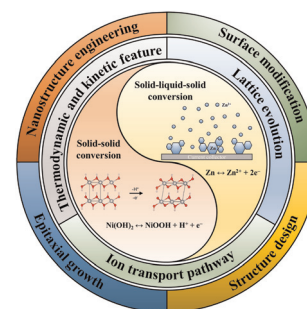


MINIREVIEW

23273

Electrode reaction mechanisms in aqueous batteries: a comparative study and perspective on solid–solid versus solid–liquid–solid conversions

Yaoming Leng, Zhongxi Zhao,* Jianwen Yu,
Jiangfeng Huang, Junshuo Lian and Peng Tan*

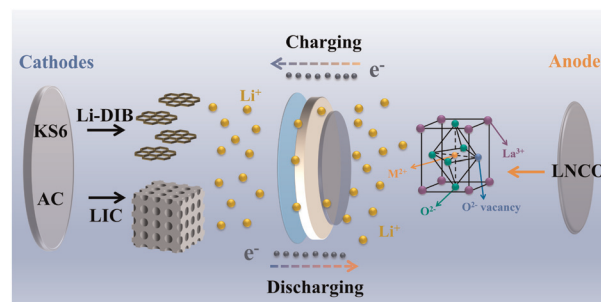


COMMUNICATIONS

23288

Exploring the insertion mechanism of pseudocapacitive perovskite oxide La–Ni–Co–O anode materials and the application to Li-ion capacitor and Li-based dual ion batteries

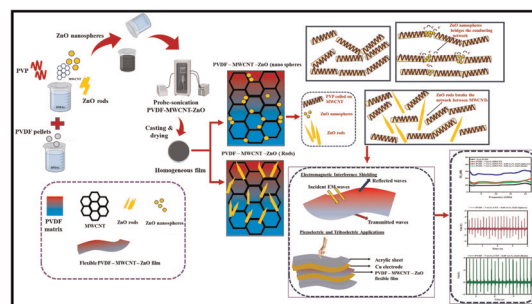
Yi Li, Yuxi Huang, Rui Ding,* Caini Tan, Jian Guo,
Yiqing Lu, Zhiqiang Chen, Yibo Zhang and Runzhi Xu



23296

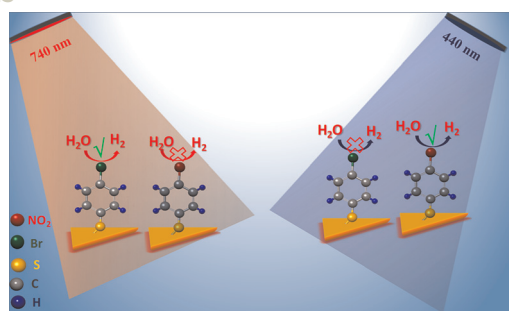
Morphology-driven multifunctionality: tailoring ZnO for enhanced EMI shielding and energy harvesting in PVDF/MWCNT nanocomposites

Aleena Sabu, Pooja U., Meera B. Nair, Dinesh K. Shukla,
Rajkumar Patel, Pratheep Kumar Annamalai, Amit Malakar,
Suryasarathi Bose and Ramanujam Brahmadesam Thoopul
Srinivasa Raghava*



COMMUNICATIONS

23315

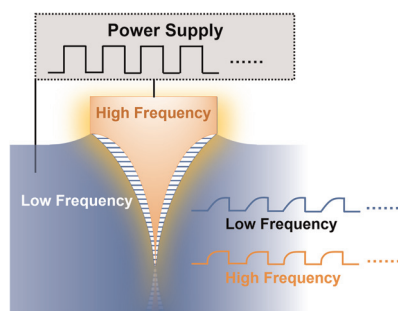


Controlling plasmonic charge carrier flow at a nanoparticle–molecule interface using ligand chemistry

Gayatri Joshi, Kalyani Patrikar, Uditi Singhal, Anirban Mondal* and Saumyakanti Khatua*

PAPERS

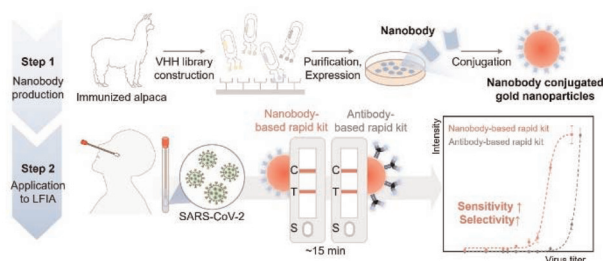
23323



Nanoscale sharpening of Ag tip apexes using high-frequency pulsed electrochemical machining

Yongkai Xiao, Wenao Liao, Honghua Ma, Yingshuang Fu and Shuyi Liu*

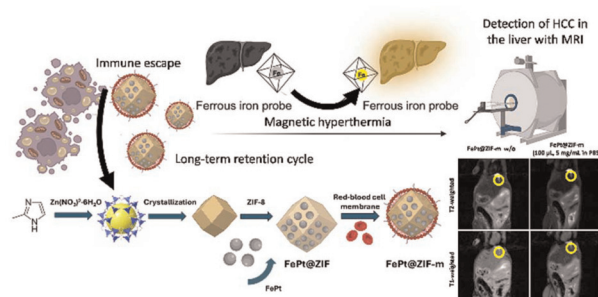
23329



Nanobody engineering for enhanced-sensitivity rapid COVID-19 tests

Eunji Jeong, Seo Yeong Oh, Seong Uk Son, Sojeong Lee, Ryunhyung Kim, Jaewook Lim, Sunjoo Kim, Taejoon Kang, Juyeon Jung, Seung-Yong Seong, In-Young Jang, Jong Hyun Kim, Eunhee Jang, Hyoung Hwa Jeong, Eun-Kyung Lim* and Seungjoo Haam*

23343



Biomimetic red blood cell membrane-coated FePt metal–organic framework nanoparticles: a multifunctional theranostic system for enhanced MRI and targeted therapy

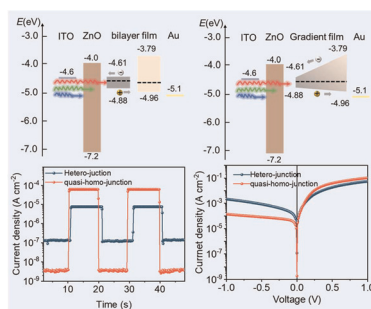
Ming-Hsien Chan,* Ru-En Zhuang, Da-Hua Wei* and Michael Hsiao



23354

Gradient bandgap engineering for performance enhancement in PbSe photodetectors

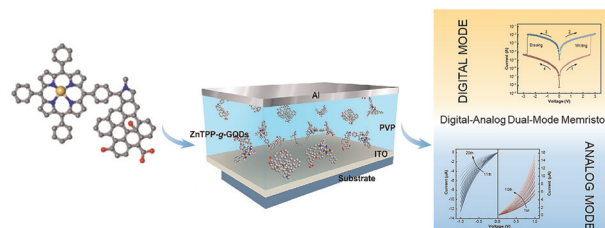
Ling Lin, Jinian Hao, Ruisi Gao, Liang Li, Xinyue Wang, Shenglin Jiang, Guangzu Zhang and Kanghua Li*



23363

Graphene quantum dots covalently functionalized with zinc porphyrin for digital-analog dual-mode memristors

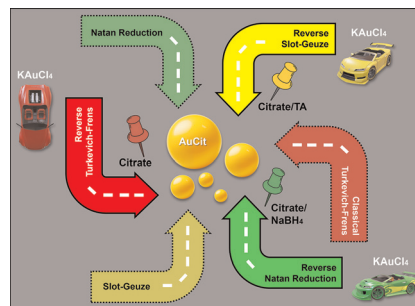
Fengrui Duan, Fei Fan,* Tianyue Huang, Wei Li, Sai Sun* and Bin Zhang*



23373

Comparative analysis of synthesis techniques for citrate-capped gold nanoparticles: insights into optimized wet-chemical approaches for controlled morphology and stability

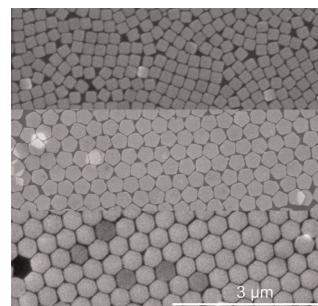
Sarah Salloum, Juliana R ther, Z beyde Celik and Christoph Janiak*



23387

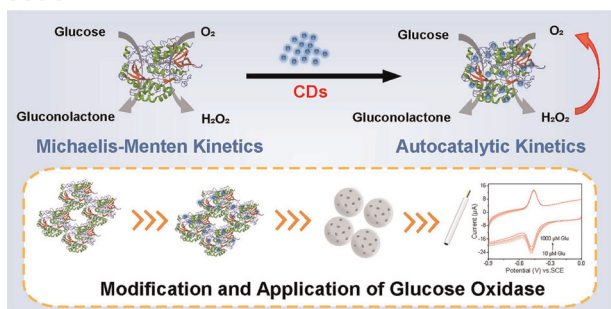
Shape effects on the 2D self-assembly of lithographically fabricated nanoparticles

Yi-Yu Cai, Zeyu Gu, Shengsong Yang, Christopher B. Murray and Cherie R. Kagan*



PAPERS

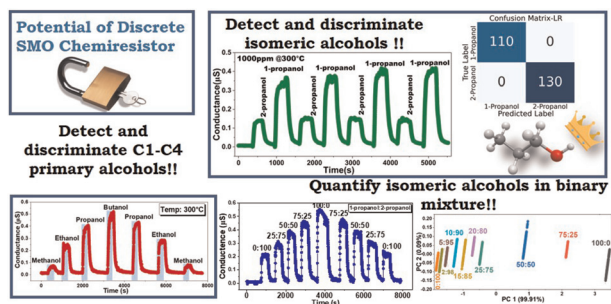
23393



Carbon dots endow glucose oxidase with autocatalytic features and anti-poisoning ability

Tao Hu, Mengling Zhang,* Wenwen Li, Huiwen Shu, Jiahui Dong, Hao Li, Yang Liu,* Hui Huang* and Zhenhui Kang*

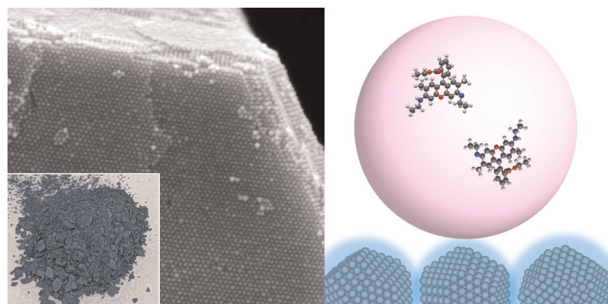
23403



Unveiling the potential of a discrete titania chemiresistor: broad-spectrum sensing of C1–C4 alcohols and precise C3 isomer discrimination in binary mixtures

S. Paine, A. Bera, A. Choudhury* and K. Mukherjee*

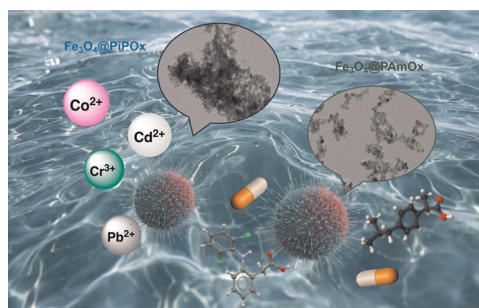
23416



Direct synthesis of three-dimensional Ag nanocrystal superlattices and their superhydrophobic films for a potential surface-enhanced Raman scattering substrate

Lingkai Zhu, Nao Nagai, Yan Xia, Mitsuki Muto, Toshiharu Teranishi* and Masaki Saruyama*

23425



Polyoxazoline functionalized magnetic spinel iron oxide nanoparticles for efficient removal of pharmaceuticals and heavy metal ions from water

Agnese Ricci,* Luca Stefanuto, Sara Del Galdo, Simone Pepi, Valerio Graziani, Stefano Casciardi, Sawssen Slimani, Gaspare Varvaro, Davide Peddis, Luca Tortora, Barbara Capone, Claudio Rossi, Daniela Tofani, Giancarlo Masci* and Tecla Gasperi*

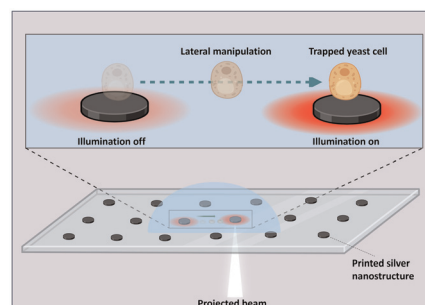


PAPERS

23436

White-light-driven plasmonic nanoparticle printing for opto-thermal manipulation and SERS application

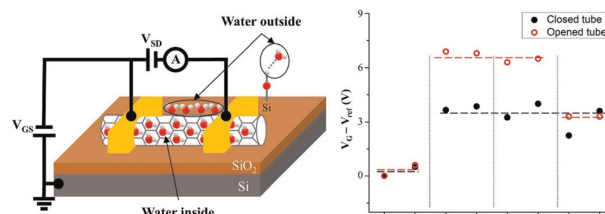
Shreyas Mysuru Shivalingegowda and Sajan D. George*



23443

Electronic fingerprints of confined and adsorbed water in SWCNTs

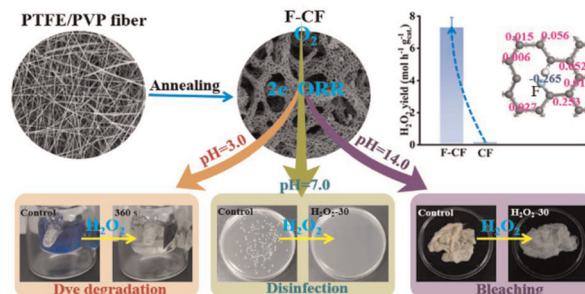
Said Pashayev, Romain Lhermerout, Christophe Roblin, Eric Alibert, Remi Jelinek, Nicolas Izard, Rasim Jabbarov, Francois Henn and Adrien Noury*



23449

Simultaneously modulating the morphology and electronic structure of carbon-fiber: a strategy for constructing an efficient electrocatalyst for the *in situ* production of H₂O₂ over a wide pH

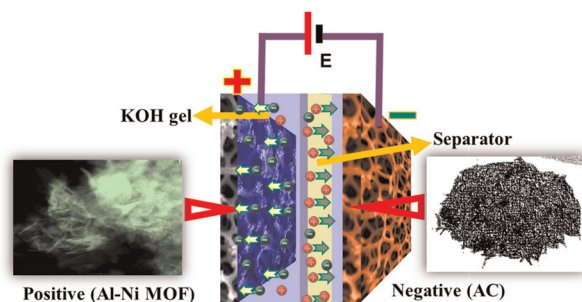
Lizhi Liu, Qing Xiong, Caixia Li, Chenglu Yan, Huaqiao Peng, Huiyong Wang, Juan Du,* Baozhan Zheng* and Yong Guo*



23458

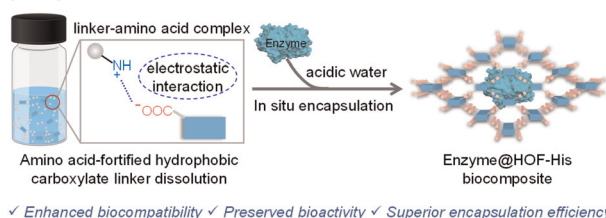
Durable and efficient BTC-assisted 2D/0D Al-Ni-MOF nanostructures for modern electrochemical energy systems

Xiaolong Leng, S. V. Prabhakar Vattikuti, Mohan Rao Tamtam,* Jaesool Shim,* Huynh Thanh Liem* and Nam Nguyen Dang



PAPERS

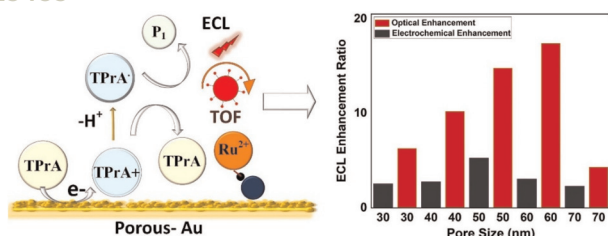
23473



An amino acid-fortified *in situ* encapsulation strategy for constructing highly active enzyme@HOF biocomposites

Qiaoyi Cen, Huairou Zhu, Jiayin Huang, Dan Yan, Ningyi Zhong, Xinyuan Zhu, Fang Zhu, Guosheng Chen,* Wei Yi,* Siming Huang* and Gangfeng Ouyang

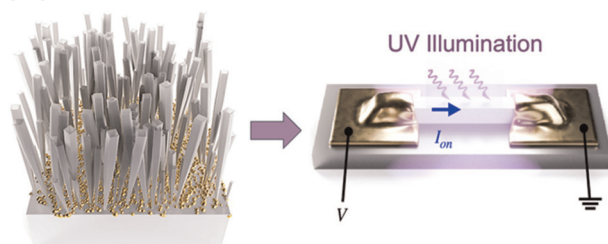
23483



Surface-enhanced electrochemiluminescence with mesoporous gold: understanding the electrochemical and optical effects

Abubakkar Khan, Xuhua Xu, Jiawei Shen and Xiaoyu Cheng*

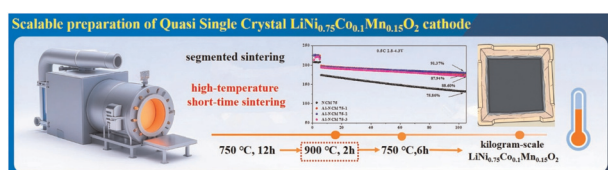
23492



Combined role of H₂O and O₂ adsorbates on the persistent UV photoconductivity of perfectly square SnO₂ nanotubes

Ryan L. Adams, Maxime Le Ster, Hiep N. Tran, Jim G. Partridge, Nicola Gaston, Tim D. Veal, Roger J. Reeves and Martin W. Allen*

23503



Lattice stability-induced enhanced performance of a quasi-single-crystal LiNi_{0.75}Co_{0.1}Mn_{0.15}O₂ cathode for lithium-ion batteries

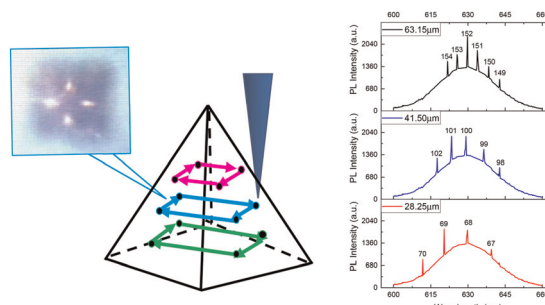
Peng Du, Fuxin Hou, Mengzhen Wang, Xinyan Du, Mingxue Feng and Chengkai Yang*



23511

A convenient strategy for tunable quasi-WGM lasing in pyramid structures enabled by Förster resonance energy transfer

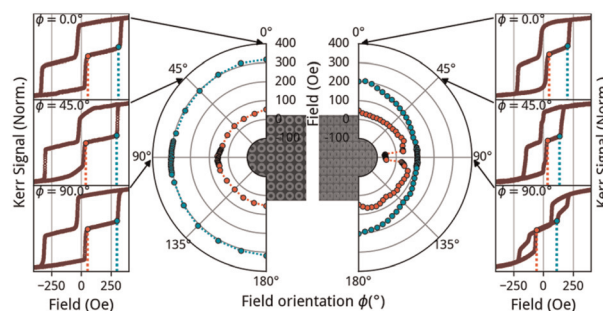
Tsung Chi Lee, Hsia Yu Lin, Yu Chuan Tsao, Guan Zhang Lu, Ya-Ping Hsieh and Yang Fang Chen*



23520

Interplay of geometry and magnetic coupling in ferromagnetic nanorings

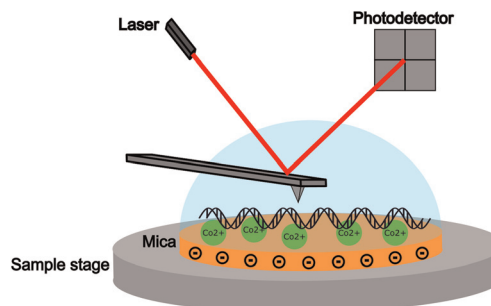
Szymon P. Oramus, Julius de Rojas, Jay R. Scott, Ben Nicholson, Del Atkinson and Adekunle O. Adeyeye*



23529

Co²⁺-mediated adsorption facilitates atomic force microscopy of DNA molecules at double-helix resolution

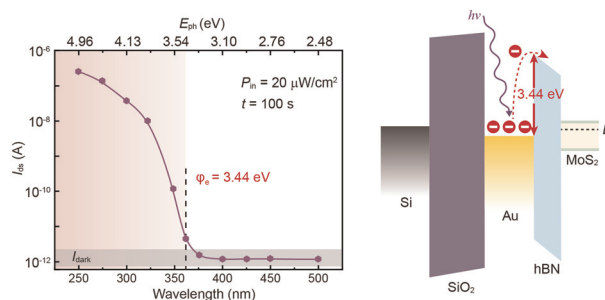
Mark Pailing, Taiana Maia de Oliveira, Maria M. Flocco and Bart W. Hoogenboom*



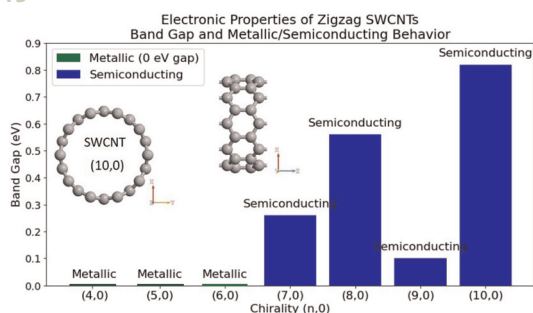
23539

Highly sensitive and spectrally tunable UV photodetectors via interface barrier engineering in floating-gate transistors

Bangchi Huang, Xiang Li, Jianlin Shi, Jinhan Hu, Zhipeng Zhong, YeZhao Zhuang, Junju Zhang, Wu Shi, Xiaosheng Fang, Hai Huang,* Jianlu Wang and Junhao Chu



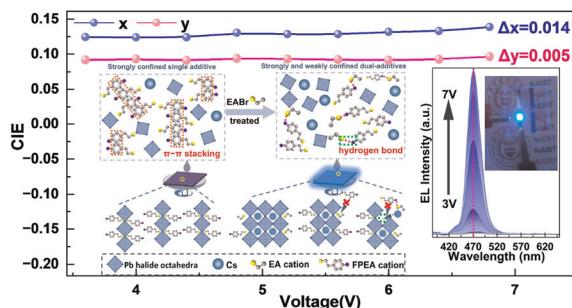
23549



Device-level modelling for predicting the total density of states of single-walled CNTs with increasing chirality: a fusion of *ab initio* modeling and a machine learning framework

Vusala Nabi Jafarova,* Debarati Dey Roy, Khayala Ajdar Hasanova, Mihaela Luminita Barhalescu and Ionut-Cristian Scurtu

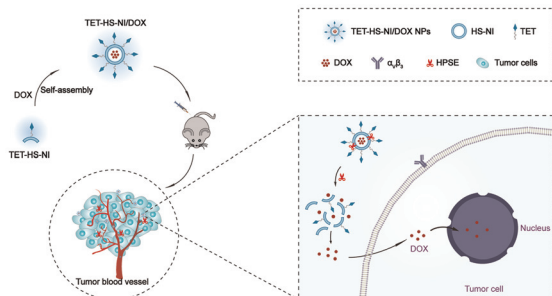
23570



Dual additives balance phase distribution in all-bromide quasi-2D perovskites for spectrally stable pure-blue light-emitting diodes

Xingle Shang, Wenjun Yuan, Haoqi Li, Yifei Wang, Kun Zhang, Xinrui Chen, Zezhou Jiao, Hengyang Xiang* and Haibo Zeng*

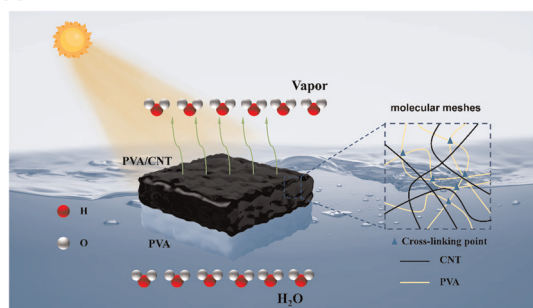
23581



Heparanase-responsive nanomaterial for anaplastic thyroid cancer chemotherapy

Xiaofen Yi, Xiangyu Jin, Huihui Yan, Tong Xu, Lu Chen, Dingyi Yu, Kai Wang and Ping Huang*

23589



CNT/PVA-PVA double-layer hydrogel interfacial evaporators for stable solar desalination and water purification

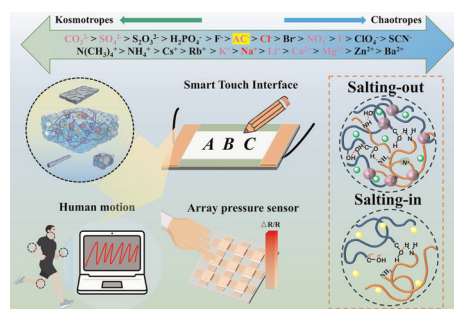
Jingyi Wang, Yongqian Cui, Xinxin Liang, Yuqing Chen, Shuochen Wang, Xin Huang, Nurxat Nuraje and Chuanyi Wang*



23599

Dynamically *in situ* tunable, highly robust and sensitive ionically conductive hydrogels enabled by the Hofmeister effect for potential sensor arrays

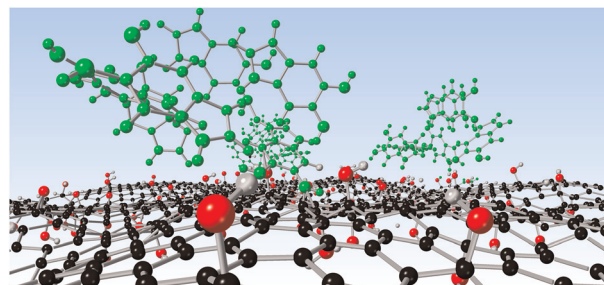
Xiang Di,* Yanghang Zhong, Yi Wang, Yufei Zhang, Jinduo Xue, Xuzhe Huang, Keming Qin, Xuefeng Gao and Chungang Yuan*



23612

Nanoscale imaging and atomic vibrations of eumelanin superstructures modulated by functionalized micronized graphene oxide

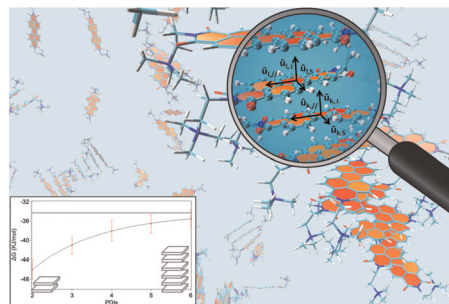
Roberto Matassa,* Sara Mattiello, Gustavo Guerreiro Candido Soares, Juan G. Lozano, Ana M. Beltrán, Costantino Zazza, Nico Sanna, Jun Wei Phua, Jose Mauricio Rosolen, Andrea Di Cicco, Javad Rezvani and Roberto Gunnella



23626

Anticooperative self-assembly of perylene diimide dyes in water unveiled by advanced molecular dynamics simulations

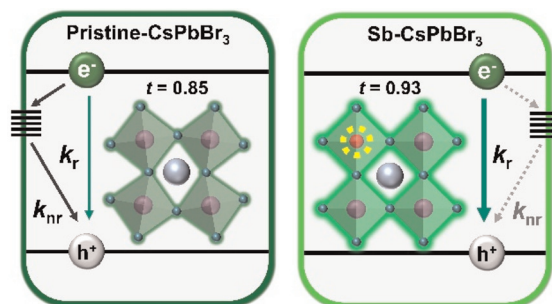
Marta Cantina, Daniele Padula, Alekos Segalina, Samuele Giannini, Fabrizio Santoro, Giacomo Prampolini* and Mariachiara Pastore*



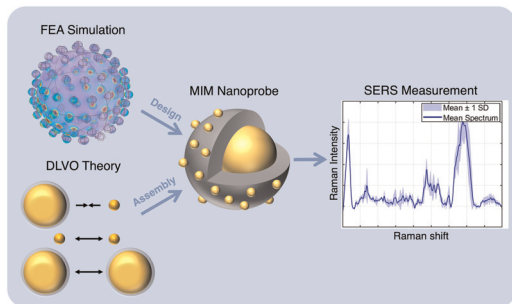
23642

Impact of trivalent Sb³⁺-ion doping on charge carrier recombination dynamics of cesium lead bromide perovskite quantum dots

Jinwoong Jo, Jaesang Yu, Chanwoo Kim, Inyoung Cho, Kyeong Mo Lim, Jooyoung Sung,* Juwon Oh* and Jaesung Yang*



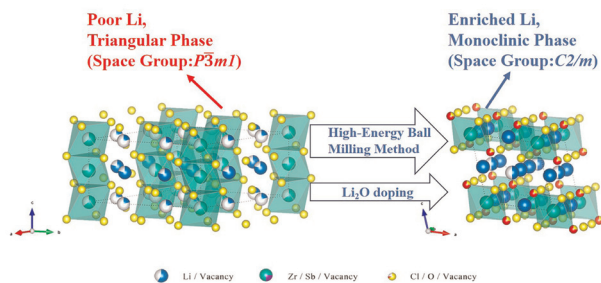
23654



Controlled synthesis of metal–insulator–metal nanoparticles for enhanced Raman spectroscopy

Junhu Zhou, Xin Qi* and John X. J. Zhang*

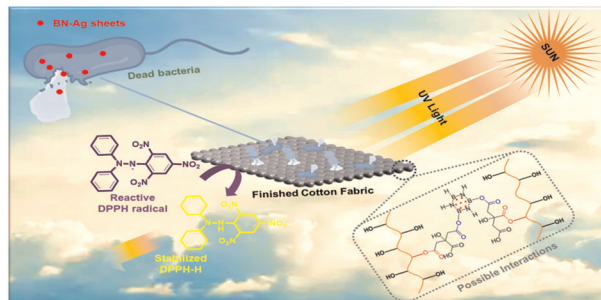
23667



A low-cost, lithium-rich zirconium-based oxyhalide solid electrolyte featuring an efficient ion transport structure

Qingtao Wang,* Pengfei Du, Peng Zhang, Zhenyang Shen, Yongmei Zhou and Ying Liu*

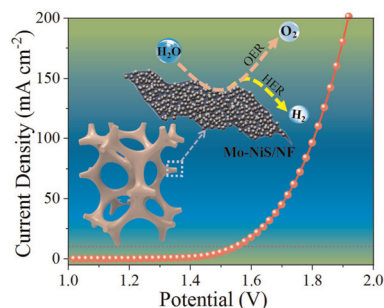
23676



Silver-decorated boron nitride nanocomposite-infused cotton fabric with durable antimicrobial and multifunctional properties

Swati Bishnoi, Gulshitab Aalam, Tariq Ahmad Mir, S. Wazed Ali and Sudip K. Pattanayek*

23694



Engineering sulfur vacancy defects in self-supporting Mo-doped NiS ultrathin nanosheets grown *in situ* on nickel foam for enhanced water splitting

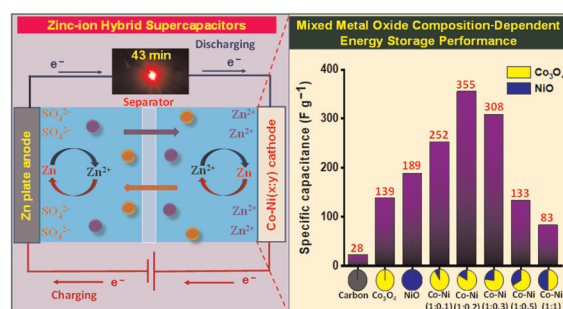
Hang Zhang,* Chaochao Tao, Lei Wang, Hualan Xu, Yuan Li and Shengliang Zhong*



23703

Design of multicore–shell structured Co_3O_4 –NiO nanocomposites as high-performance cathodes for zinc-ion hybrid supercapacitors

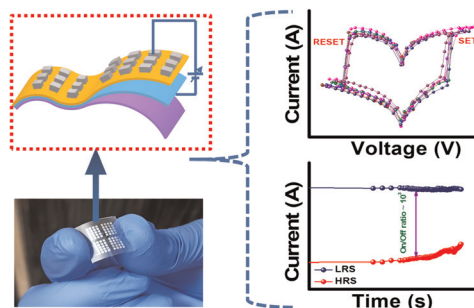
Sankar Sarathkumar, Raji Yuvaraja, Venkatesan Gowsalya, Sorna Pandian Anitha Juliet, Selvakumar Veeralakshmi, Thangaraj Vijayalakshmi, Yazen Al-Lami and Selvan Nehru*



23716

Fabrication of flexible memristors using PMMA-rGO/Au nanocomposite thin films with improved stability and retention time

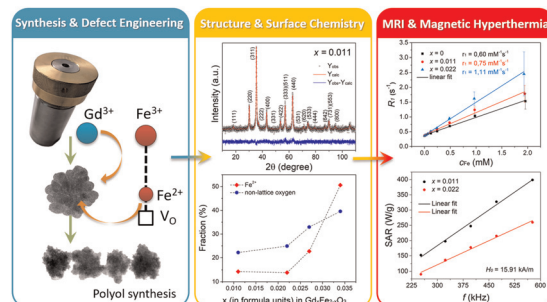
Shivam Awasthi, Subarna Pramanik, Rajarshi Chakraborty, Anita Mohan and Bhola Nath Pal*



23727

Ultra-low gadolinium doping in multi-core iron oxide enables efficient dual-mode MRI and magnetic hyperthermia: a structure–function study

Miloš Ogrjanović,* Hristo Kolev, Ralitsa Mladenova, Jana Vojtova, Oliver Strbak, Martin Fabián, Vladimír Girman, Biljana Dojčinović, Sanja Vranješ-Đurić and Bratislav Antić*



CORRECTION

23740

Correction: WS_2 nanosheet as a new photosensitizer carrier for combined photodynamic and photothermal therapy of cancer cells

Yuan Yong, Liangjun Zhou, Zhanjun Gu,* Liang Yan, Gan Tian, Xiaopeng Zheng, Xiaodong Liu, Xiao Zhang, Junxin Shi, Wenshu Cong, Wenyan Yin* and Yuliang Zhao*

