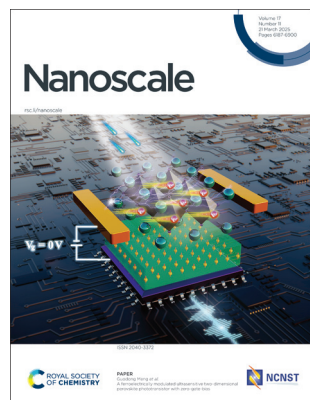


IN THIS ISSUE

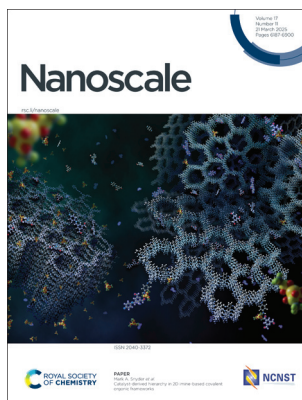
ISSN 2040-3372 CODEN NANOHL 17(11) 6187–6900 (2025)



Cover

See Guodong Meng *et al.*, pp. 6481–6487.

Image reproduced by permission of Junyi She, Xin Liu, Jun Xi and Guodong Meng from *Nanoscale*, 2025, **17**, 6481.



Inside cover

See Mark A. Snyder *et al.*, pp. 6488–6504.

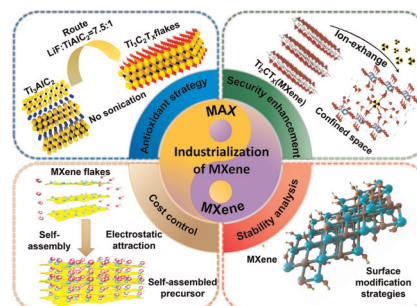
Image reproduced by permission of Mark A. Snyder/SayoStudio from *Nanoscale*, 2025, **17**, 6488.

REVIEWS

6204

Engineering the next generation of MXenes: challenges and strategies for scalable production and enhanced performance

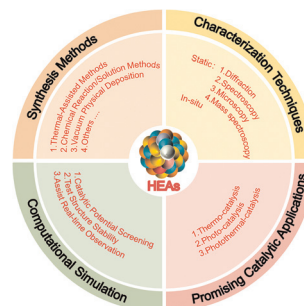
Weizhai Bao,* Hao Shen, Guozhao Zeng, Yangyang Zhang, Yaoyu Wang, Dingyu Cui, Jingjie Xia, King Jing, He Liu, Cong Guo, Feng Yu, Kaiwen Sun* and Jingfa Li*



6266

Nanoscale high-entropy alloys for solar and thermal applications

Xinyang Li, Yalong Zou, Haijiao Lu* and Lianzhou Wang



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)

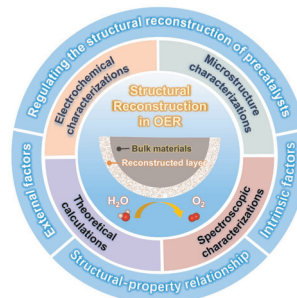
Apply now

rsc.li/professional-development

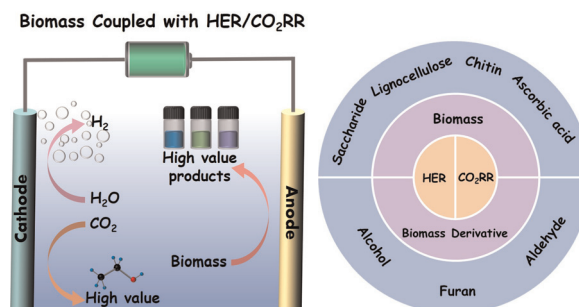


Kaixi Wang, Yifei Xu, Vahid Daneshvariesfahlan,
Moniba Rafique, Qiang Fu,* Hang Wei, Yumin Zhang,
Jiheng Zhang, Bing Zhang and Bo Song*

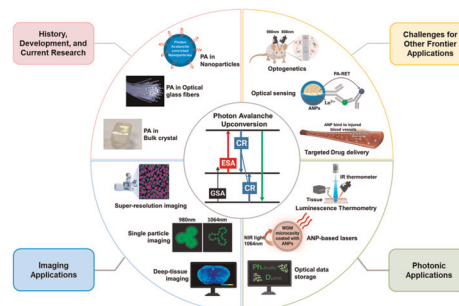
Kaixi Wang, Yifei Xu, Vahid Daneshvariesfahlan,
Moniba Rafique, Qiang Fu,* Hang Wei, Yumin Zhang,
Jiheng Zhang, Bing Zhang and Bo Song*



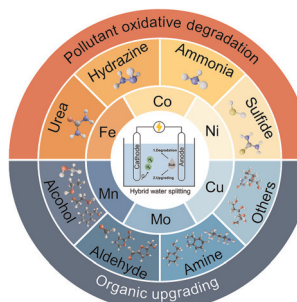
Shuke Li, Lin Ye, Wanglai Cen and Dengrong Sun*



Shradha Aggarwal

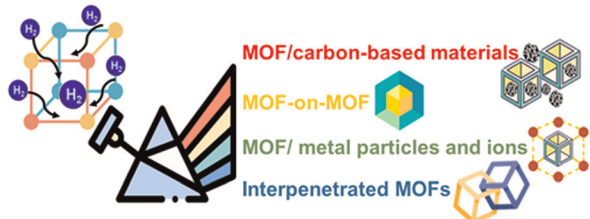


Ye-Zhou Hu, Shu-Feng Zhang, Xiao-Le Han* and Yi Liu*



REVIEWS

6390

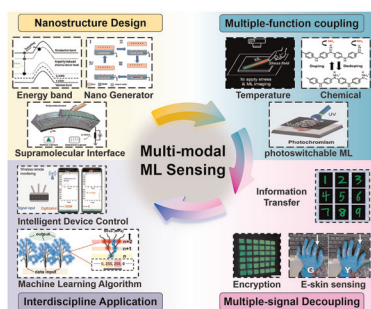
MOF hybrids for H_2 storage

Latest developments in the synthesis of metal–organic frameworks and their hybrids for hydrogen storage

Laura Jimenez-Lopez, Rafael Morales Ospino, Leandro Goulart de Araujo, Alain Celzard and Vanessa Fierro*

MINIREVIEWS

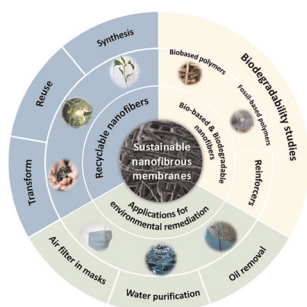
6414



Recent advances in multimodal mechanoluminescent sensors enabled by nanostructure design

Zihao Wang, Jiaman Hu, Minglin Yang, Jize Liu* and Xinxing Zhang*

6427

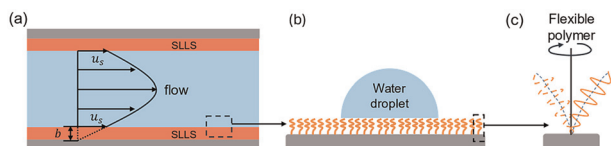


Sustainable nanofibrous membranes for air filtration, water purification and oil removal

Nayli Erdeanna Binte Surat'man, Xin Lin Quek, Nannan Wang, Enyi Ye, Jianwei Xu, Zibiao Li* and Bofan Li*

COMMUNICATIONS

6448



Slippery liquid-like surfaces as a promising solution for sustainable drag reduction

Lingxuan Hao and Bei Fan*

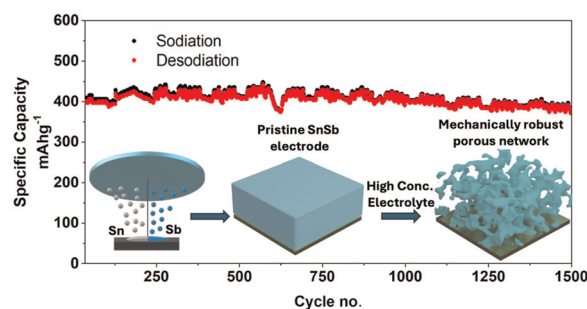


COMMUNICATIONS

6460

SnSb as a long cycle life anode material for sodium-ion batteries enabled by a high concentration electrolyte

Stephen O'Sullivan, Temilade Esther Adegoke, Kevin M. Ryan, Hugh Geaney and Tadhg Kennedy*

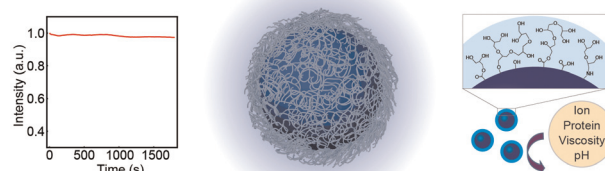


6466

Carbon quantum dots modified with hyperbranched polyglycerol for bioapplications: improved photostability and temperature selectivity

Shingo Sotoma,* Kota Shiraya, Suzune Shimomura, Yumi Yoshida and Kohji Maeda

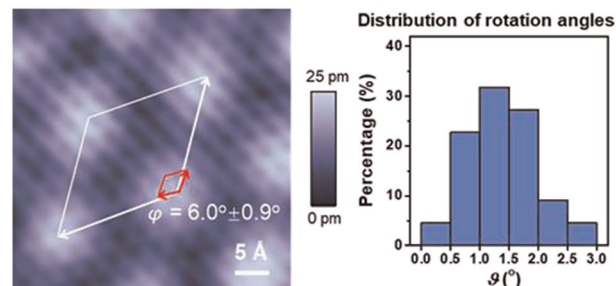
Carbon quantum dot with polyglycerol coating



6474

Small-rotation-angle moiré structures of 2H TaSe₂ monolayers on Au(111)

Lina Liu,* Dmitry Y. Zemlyanov and Yong P. Chen*

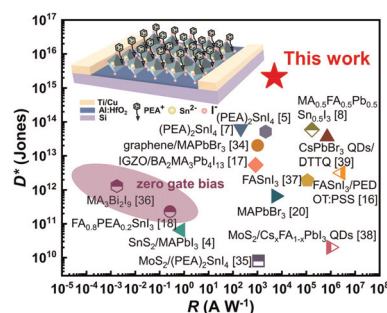


PAPERS

6481

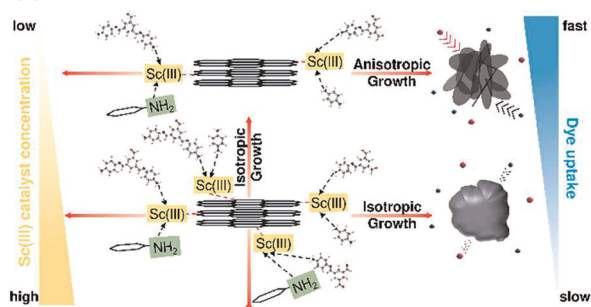
A ferroelectrically modulated ultrasensitive two-dimensional perovskite phototransistor with zero-gate-bias

Junyi She, Hanlin Cen, Zhiheng Shen, Jianyu Wang, Xin Liu, Jun Xi, Yonghong Cheng and Guodong Meng*



PAPERS

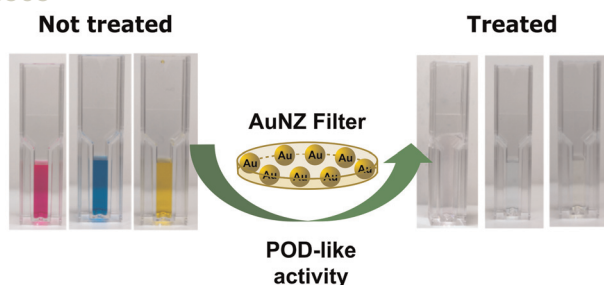
6488



Catalyst-derived hierarchy in 2D imine-based covalent organic frameworks

Hao Guo, Joseph P. Cline, Ryan Thorpe, Christopher J. Kiely, Srinivas Rangarajan and Mark A. Snyder*

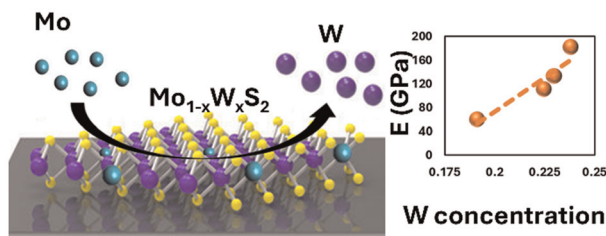
6505



Gold nanozymes for efficient degradation of organic dye pollutants: outperforming natural enzymes

Giulia Mirra, Lorenzo Cursi, Marina Veronesi, Luca Boselli and Pier Paolo Pompa*

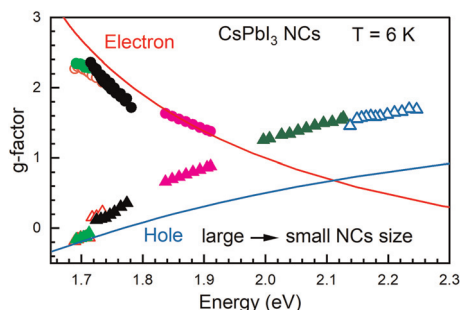
6512



Mechanical modulation of 2D transition metal dichalcogenide alloys

Guy Alboteanu, Dan Mordehai and Assaf Ya'akovovitz*

6522



Landé *g*-factors of electrons and holes strongly confined in CsPbI₃ perovskite nanocrystals in glass

Sergey R. Melnikov,* Evgeny A. Zhukov, Vasilii V. Belykh, Mikhail O. Nestoklon, Elena V. Kolobkova, Maria S. Kuznetsova, Manfred Bayer and Dmitri R. Yakovlev*

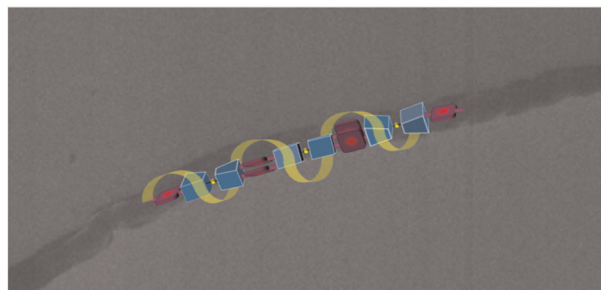


PAPERS

6530

Towards 1D supramolecular chiral assemblies based on porphyrin–calixarene complexes

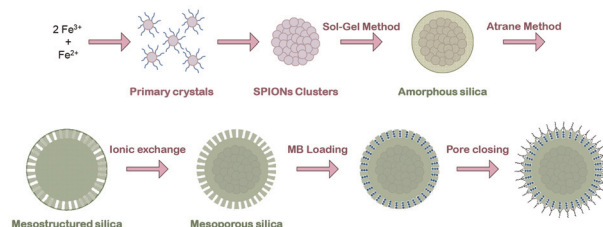
Massimiliano Gaeta,* Chiara M. A. Gangemi, Matteo Barcellona, Gabriele Travagliente, Marco Milone, Anna Notti,* Maria E. Fragalà, Ilenia Pisagatti, Melchiorre F. Parisi, Roberto Purrello and Alessandro D'Urso*



6539

A rapid synthesis of magnetic-core mesoporous silica-shell nanostructures – as potential theranostic agents – by means of microwave irradiation and the atrane method

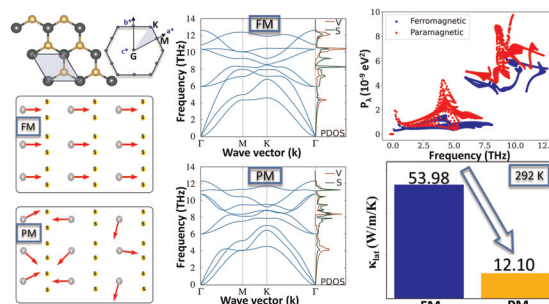
M. Dolores Garrido,* Bejan Hamawandi, José Francisco Serrano-Claumarchirant, Giovanni Marco Saladino, Adem B. Ergül, M. Dolores Marcos, José Vicente Ros-Lis, Pedro Amorós and Muhammet S. Toprak*



6550

Unveiling magnetic transition-driven lattice thermal conductivity switching in monolayer VS₂

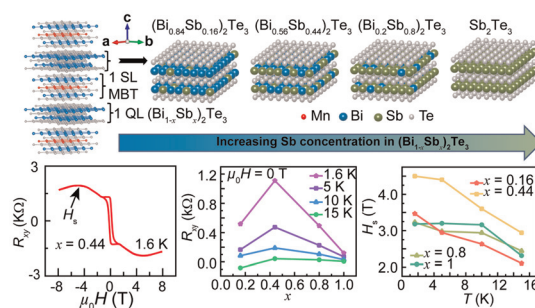
Zimmi Singh, Abhishek Kumar and Sankha Mukherjee*



6562

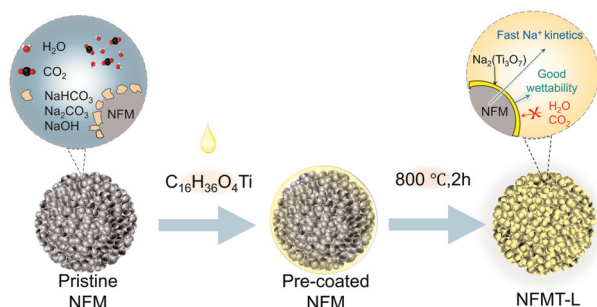
Controllable magnetism and an anomalous Hall effect in (Bi_{1-x}Sb_x)₂Te₃-intercalated MnBi₂Te₄ multilayers

Peng Chen, Jieyi Liu,* Yifan Zhang, Puyang Huang, Jack Bollard, Yiheng Yang, Ethan L. Arnold, Xinqi Liu, Qi Yao, Fadi Choueikani, Gerrit van der Laan, Thorsten Hesjedal and Xufeng Kou*



PAPERS

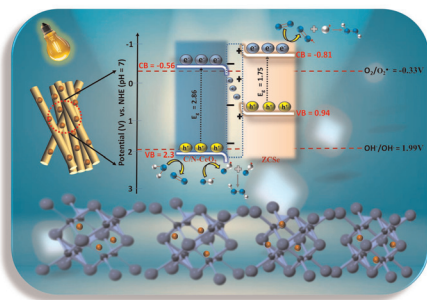
6570



Dual-enhancements of stability and wettability in O3-Na_{0.95}Ni_{1/3}Fe_{1/3}Mn_{1/3}O₂ cathodes by converting surface residual alkali into ultrathin Na₂Ti₃O₇ coatings

Haotian Gong, Baiyao Gan, Xinkang Li, Ting Long, Biao Bing Chen, Li Zou, Tong Zhou, Ziyang Ma, ZhiYe Yuan, Jiang Yin, Yahui Yang* and Lishan Yang*

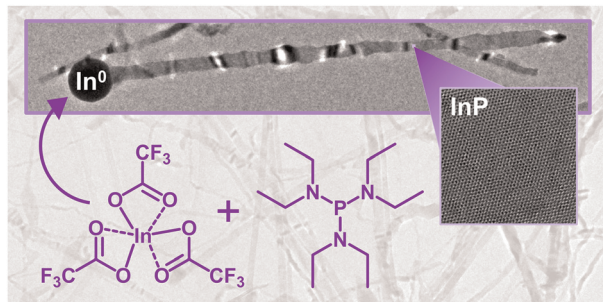
6580



Zn_{0.5}Cd_{0.5}Se quantum dot-integrated MOF-derived C/N-CeO₂ photocatalyst for enhanced H₂O₂ production and O₂ evolution reactions

Jayashree Panda, Jyotirmayee Sahu and Kulamani Parida*

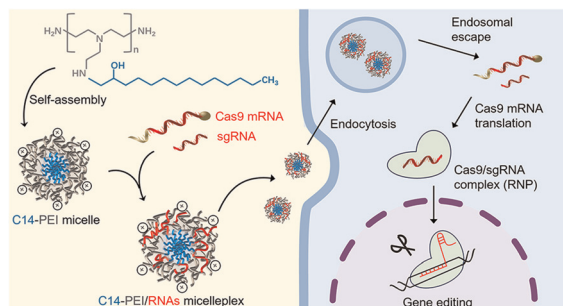
6593



Alternate InP synthesis with aminophosphines: solution-liquid-solid nanowire growth

Helen C. Larson, Zhixing Lin, François Baneyx and Brandi M. Cossairt*

6604



A novel micelleplex for tumour-targeted delivery of CRISPR-Cas9 against KRAS-mutated lung cancer

Siyu Chen, Mariem Triki, Simone Pinto Carneiro and Olivia Monika Merkel*

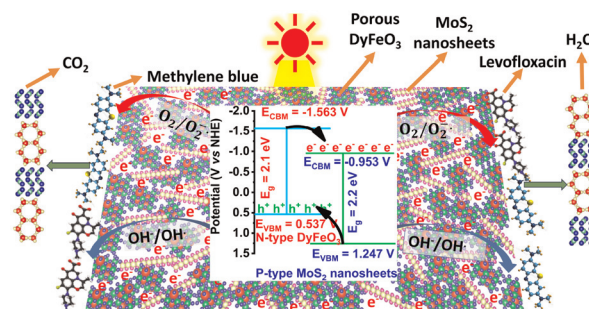


PAPERS

6620

Mechanistic insights into the enhanced photocatalytic efficiency of MoS₂-tuned DyFeO₃ heterojunction nanocomposites for pollutant degradation

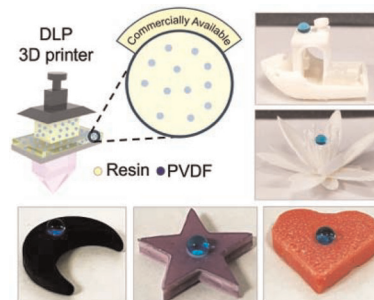
Mohasin Tarek, Ferdous Yasmeen and M. A. Basith*



6637

3D printing of superhydrophobic and multifunctional objects via simple and inexpensive vat photopolymerization

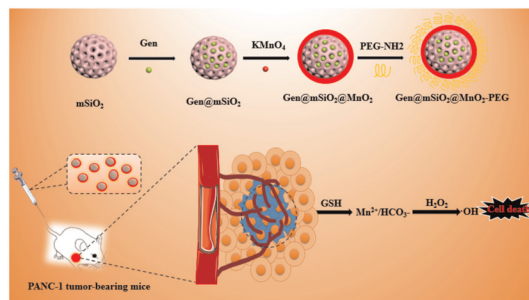
Adil Majeed Rather, Mohammed Barrubeeah, Mohammad Javad Zarei, Young Jae Kim, Sravanthi Vallabhuneni and Arun Kumar Kota*



6646

Mesoporous SiO₂ based nanocomplex enzymes for enhanced chemodynamic therapy of pancreatic tumors

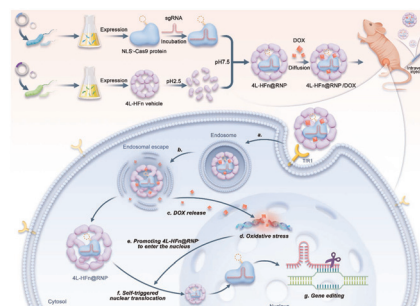
Yue Fan, Shulin Yu, Zhaoshuo Yang and Dingfang Cai*



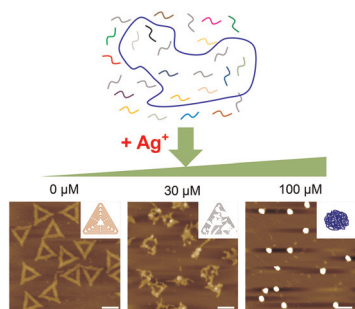
6660

Non-nuclear localization signal-guided CRISPR/Cas9 ribonucleoproteins for translocation and gene editing via apoferritin delivery vectors

Peng Sun, Shiping Wang, Qi Yan, Jia Zeng, Zhenghong Wu* and Xiaole Qi*



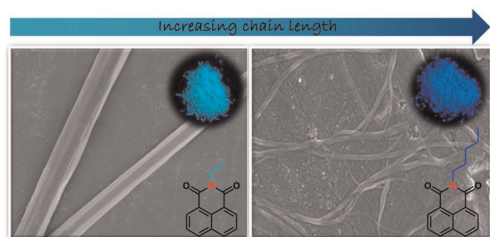
6676



Nonspecific metal-coordination-driven control over higher-order DNA self-assembly

Mengzhou Wei, Zhiyuan Zhu, Lingjun Wan and Yulin Li*

6685



Non-conjugated alkyl chain engineering to tune condensed state photophysical and supramolecular assembly properties

Niranjan Meher,* Mst Nasima Khatun, Retwik Parui and Parameswar Krishnan Iyer*

- Non-conjugated linear alkyl chain engineering
- Tuning of condensed-state emission and supramolecular nano-assembly
- In-depth analysis of structure and property relationship

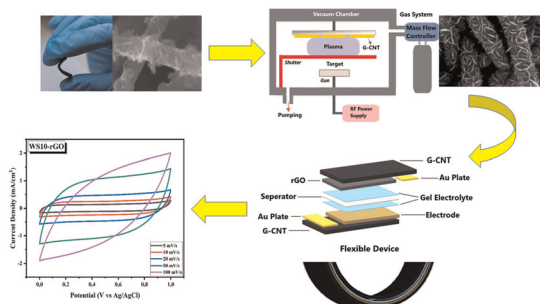
6695



Enhanced stability and optical performance of CsPbBr₃@FAPbBr₃ core-shell perovskite nanocrystals

Danila A. Tatarinov, Azat O. Ismagilov, Aleksandra V. Koroleva, Evgeniy V. Zhizhin, Weitao Zheng, Alexander V. Baranov and Aleksandr P. Litvin*

6704



Advanced flexible supercapacitors: vertical 2D MoS₂ and WS₂ nanowalls on graphenated carbon nanotube cotton

Ufuk Periřanođlu,* Esra Kavaz Periřanođlu, Züleyha Kudař, Duygu Ekin, İsmayadi İsmail and Emre Gür*

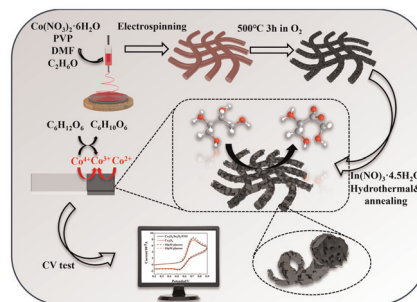


PAPERS

6718

Nanofiber-shaped $\text{Co}_3\text{O}_4@\text{In}_2\text{O}_3$ composite for high-performance enzymeless glucose sensing

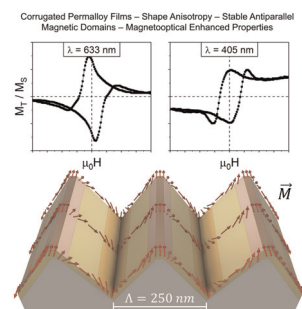
Xinda Xu, Chao Zhang, Woonchul Yang,* Yujia Li, Bing Li,* Yuvaraj Haldorai, Jiang Zhenyu and Wanfeng Xie*



6727

Stable antiparallel domains in 3D corrugated magnetic thin films

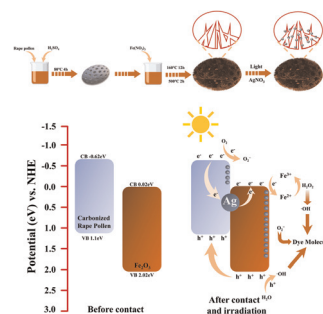
Rafael Delgado-García,* Ruben Guerrero, Gabriel Rodríguez-Rodríguez, Fernando Gálvez, Miguel Ángel Arranz and Jose Miguel Colino



6741

Unveiling the synergistic interface effects of Ag-deposited Fe_2O_3 /biochar catalysts to enhance wastewater degradation

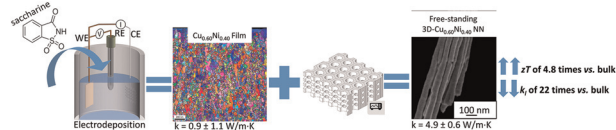
Jialin Gu, Xinshang Li, Yanping Ma, Tianyi Yang, Rui Zhang, Wenquan Zhou, He Wang and Jiangang Jiang*



6757

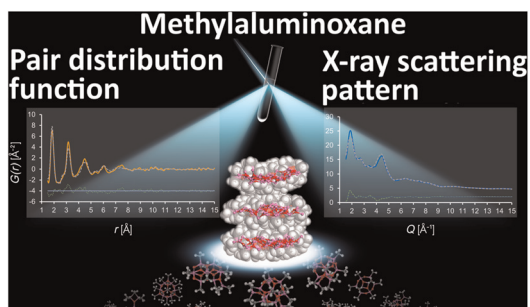
~5-Fold enhancement in the thermoelectric figure of merit of sustainable 3D-CuNi interconnected nanonetworks due to ultralow lattice thermal conductivity

Cristina V. Manzano,* Olga Caballero-Calero, Daniele Casari, Amit Sharma, Alba Díaz-Lobo, Xavier Maeder and Marisol Martín-González



PAPERS

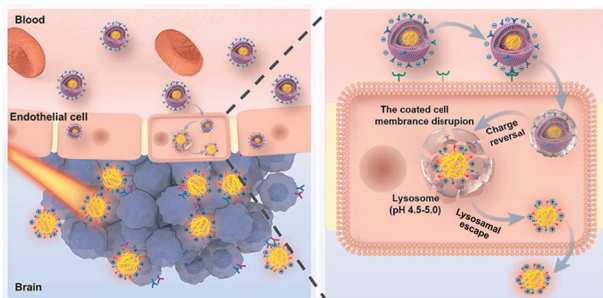
6767



Elucidation of the nano-sized molecular structure of methyaluminoxane using synchrotron X-ray total scattering

Toru Wada* and Toshiaki Taniike*

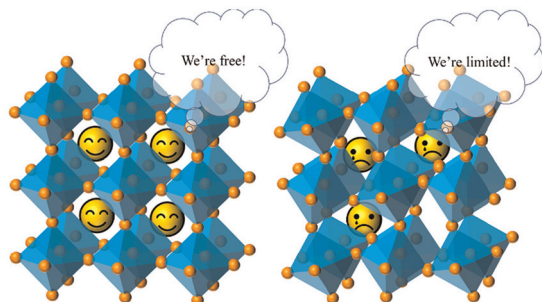
6780



Promoting transcellular traversal of the blood–brain barrier by simultaneously improving cellular uptake and accelerating lysosomal escape

Li Zhang, Weibin Li, Zhen Xu, Zhennan Mao, Mengqian Yang, Caixia Wang* and Zhihong Liu*

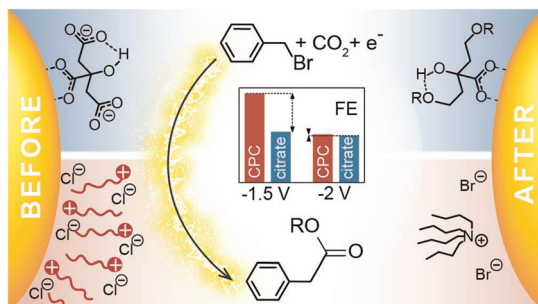
6793



Effect of Cs vacancy on thermal conductivity in CsPbBr₃ perovskites unveiled by deep potential molecular dynamics

Shuhao Han, Yujin Ji* and Youyong Li*

6804



The fate of nanoparticle surface chemistry during reductive electrosynthesis in aprotic media

Xenia V. Medvedeva, Jury J. Medvedev, Xingya Zhao, Elena Smith and Anna Klinkova*

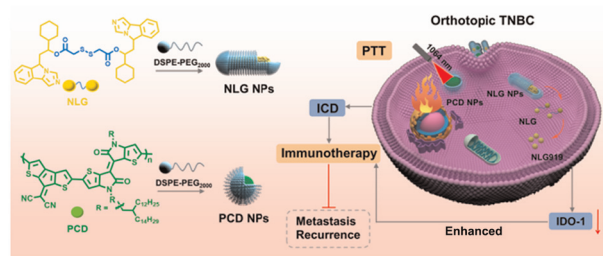


PAPERS

6815

NIR-II photothermal therapy combined with activatable immunotherapy against the recurrence and metastasis of orthotopic triple-negative breast cancer

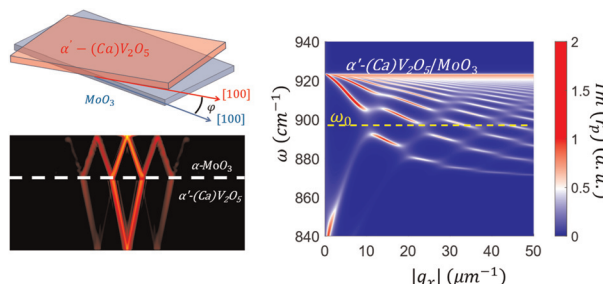
Wentao Lei, Yinghui Wang, Tangyue Zheng, Qihang Wu, Hui Wen, Tingting Sun,* Jun Liu* and Zhigang Xie*



6827

Tuning polariton hybridization in hyperbolic hetero-bicrystals by twist angle engineering

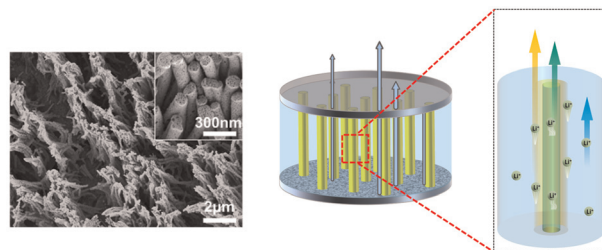
Yaohong Wang, Guolong Ma, Zhiqiang Li* and Lu Wen*



6833

Constructing vertically aligned Li⁺ transport pathways in a flexible solid polymer composite electrolyte by a soft template approach

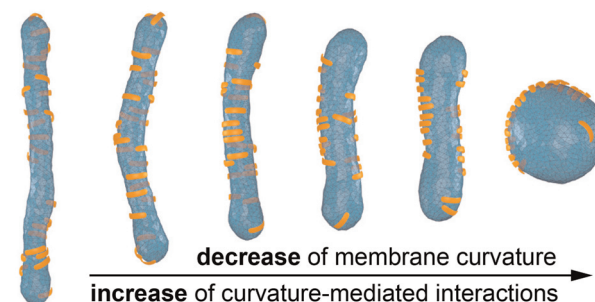
Shaoyin Li, Yunke Wang, Jose Anguita, Kai Yang and S. Ravi P. Silva*



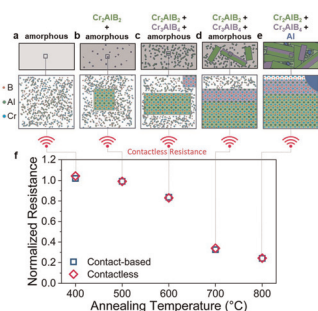
6841

Membrane-mediated interactions between arc-shaped particles strongly depend on membrane curvature

Francesco Bonazzi and Thomas R. Weikl*



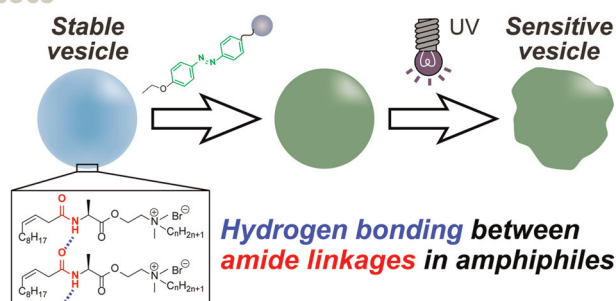
6854



Contactless health monitoring in autonomous self-reporting ceramic coatings

Peter J. Pöllmann,* Sebastian Lellig,* Dimitri Bogdanovski, Amir Hossein Navidi Kashani, Damian M. Holzapfel, Clio Azina, Peter Schweizer, Marcus Hans, Paula Zöll, Daniel Primetzhofer, Szilárd Kolozsvári, Peter Polcik, Johann Michler and Jochen M. Schneider

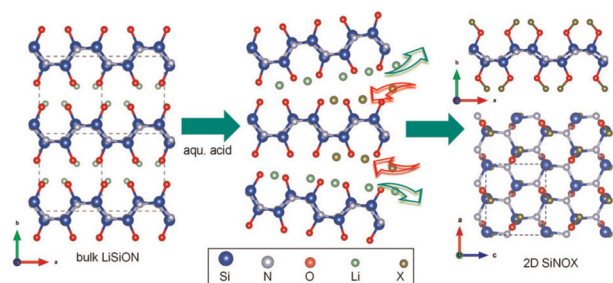
6863



A molecular strategy for creating functional vesicles with balancing structural stability and stimuli-responsiveness

Shoi Sasaki, Hibiki Ueno, Noriyoshi Arai, Kouichi Asakura and Taisuke Banno*

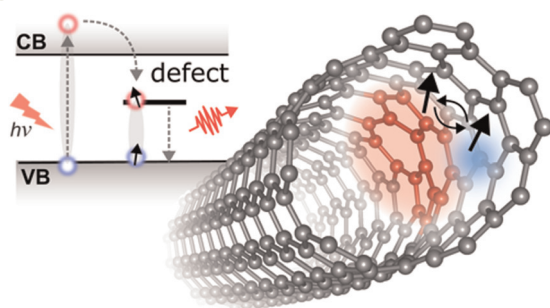
6874



Theoretical design of 2D $Pca2_1$ SiNOX (X = H, F, and Cl) phases: a new family of flexible wide bandgap semiconductors

Heng Zhang, Jiahao Yu, Sylvain Pitié, Frédéric Guégan, Junjie Wang* and Gilles Frapper*

6884



Topological defects in semiconducting carbon nanotubes as triplet exciton traps and single-photon emitters

Timur Biktagirov,* Uwe Gerstmann and Wolf Gero Schmidt



CORRECTIONS

6892

Correction: Copper nitroprusside analogue nanoparticles against melanoma: detailed *in vitro* and *in vivo* investigation

Sanchita Tripathy, Swapnali Londhe, Arti Patel, Sudipta Saha, Yogesh Chandra and Chitta Ranjan Patra*

6893

Correction: Cost-effective carbon fiber precursor selections of polyacrylonitrile-derived blend polymers: carbonization chemistry and structural characterizations

Qian Mao, Siavash Rajabpour, Mahdi Khajeh Talkhoncheh, Jiadeng Zhu, Malgorzata Kowalik and Adri C. T. van Duin*

6894

Correction: Optical response of magnetically actuated biocompatible membranes

H. Joisten,* A. Truong, S. Ponomareva, C. Naud, R. Morel, Y. Hou, I. Jourmard, S. Auffret, P. Sabon and B. Dieny

