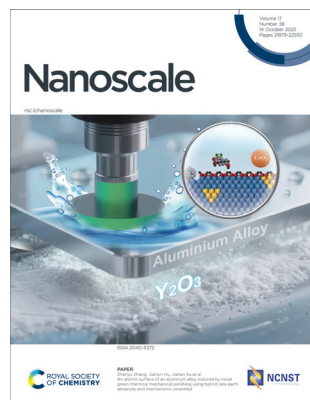


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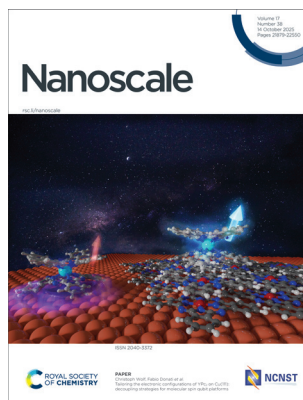
ISSN 2040-3372 CODEN NANOHL 17(38) 21879–22550 (2025)



Cover

See Zhenyu Zhang, Jianjun Hu, Jianan Xu *et al.*, pp. 22145–22162.

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Inside cover

See Christoph Wolf, Fabio Donati *et al.*, pp. 22163–22173.

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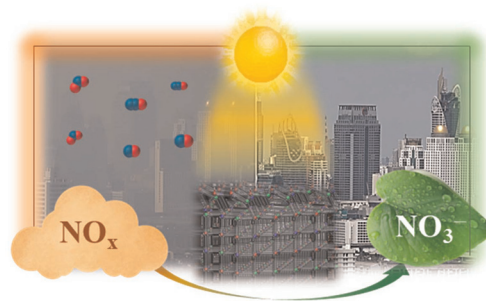
3D rendering via Blender Foundation (www.blender.org). Starry night sky photograph by Edgar Cardoso from Pexels.com.

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Nanostructured systems to combat NO_x air pollution through Vis-light activated nanoarchitectonics: how, where and why...?

Davide Barreca, Beatriz Gámiz, Chiara Maccato* and Luis Sánchez



21913

Sustainable additive manufacturing through recycled and reinforced thermoplastic composites: state of the art

Jatinder Singh,* Rakesh Kumar and Santan Chaurasiya



GOLD
OPEN
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RSC Applied Polymers

The application of polymers,
both natural and synthetic

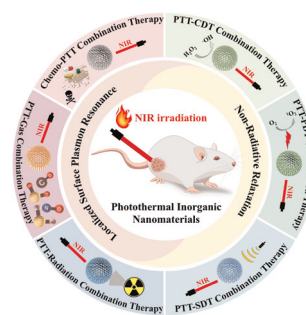
Interdisciplinary and open access

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Fundamental questions
Elemental answers

REVIEWS

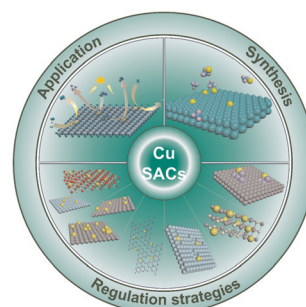
21938

Research progress of multifunctional inorganic nanomaterials for tumor photothermal therapyWei Wang, Yuzi Huang, Yuting Zhang, Shuzhang Xiao,*
Dan Luo,* Haichuang Lan and Peng Geng*

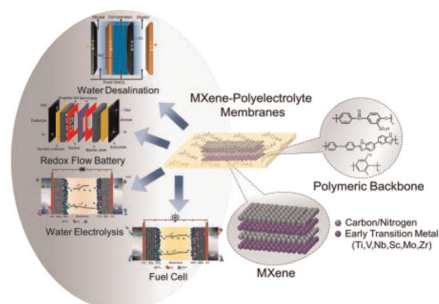
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Atomic engineering of copper sites for efficient photocatalysis

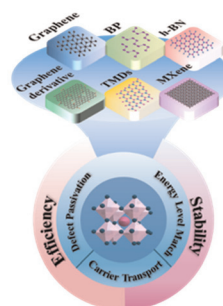
Chuan Yue Deng, Suwei Wang, Wei Jiang and Jun Di*



21986

Innovative integration of MXenes in ion-conductive polymer membranes: synthesis, properties, and applicationsVartika Sharma, Prashant Upadhyay, Linh Chi T. Cao,
Yuki Nagao and Vaibhav Kulshrestha*

22033

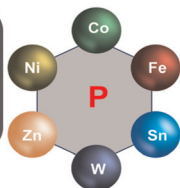
Integration of 2D materials for high-performance perovskite solar cellsBixin Li, Yanlong Wang,* Weidan Gu, Yan Hou,
Lin Wang* and Bin Du*

REVIEWS

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Designing MTMs electrodes

- ❖ Tuning stoichiometric ratios
- ❖ Elemental doping/alloying
- ❖ Nanocarbon/MTMPs hybrid
- ❖ Interface & porous structure



Energy storage applications

- ❖ Supercapacitor
- ❖ Na-ion battery
- ❖ Li-S battery
- ❖ Zn-air battery

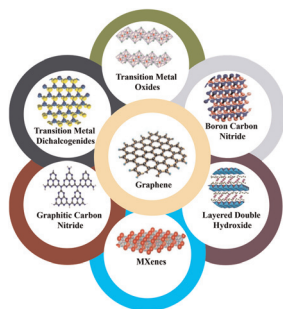


Mixed transition metal phosphides: recent progress and frontiers in secondary batteries and supercapacitors

Chandan Kumar Maity, Sayak Roy, Amrita De Adhikari, Khusboo Kumari, Myung Jong Kim* and Sumanta Sahoo*

MINIREVIEWS

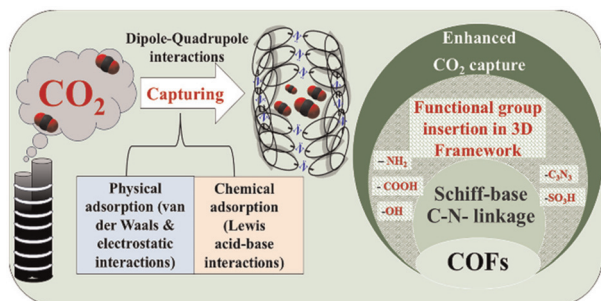
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Advancing supercapacitors with graphene-based 2D–2D heterostructures and heteroatom engineering

Pavan T, Abhishek Narayanan, Gurunatha Kargal Laxminarayana, Chandra Sekhar Rout* and Mahesh Padaki*

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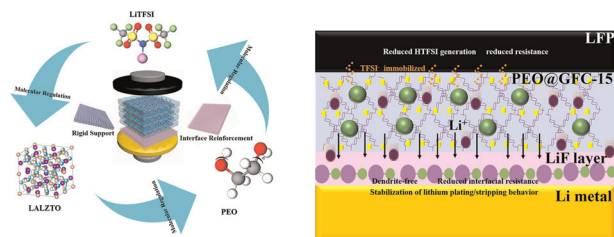


Unravelling the nanoarchitectonics of –C–N– linkages in covalent organic frameworks for CO₂ capture—a mini-review

Princy Deni Raju,* Athira Rajasekharan Sujatha, Saumya Krishnan and Chettiyam Veetil Suneesh*

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Rigid support–molecular regulation–interface reinforcement synergistic strategy enables PEO-based electrolytes for solid-state lithium batteries

Yingtai Zhao, Xiangping Feng, Xin Sun, Lei Zhang,* Zhishuang Song, Jinzhu Zhao, Zhiyuan Wang, Runguo Zheng,* Hongyu Sun* and Yanguo Liu*

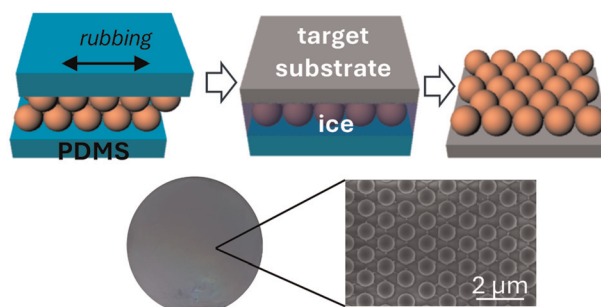


COMMUNICATIONS

22134

A high-quality and -throughput colloidal lithography by mechanical assembly and ice-based transfer

Sivan Tzdaka, Sanjay Singh Eswara Singh, Abed Al Kader Yassin, Esti Toledo, Jatin Jawahir Pandit, Angel Porgador and Mark Schwartzman*

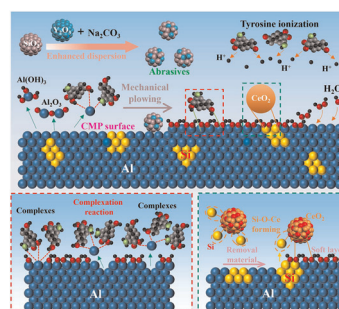


PAPERS

22145

An atomic surface of an aluminum alloy induced by novel green chemical mechanical polishing using hybrid rare earth abrasives and mechanisms unraveled

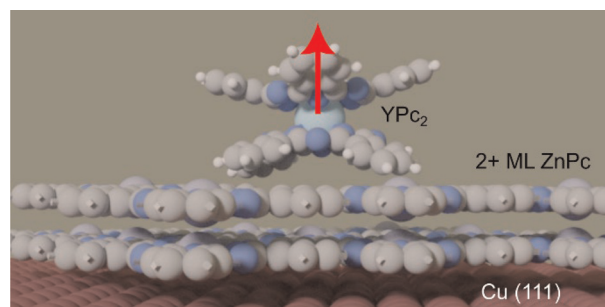
Zeyun Wang, Zhenyu Zhang,* Pengfei Hu, Ganggang Liu, Jianjun Hu,* Jianan Xu,* Huaxiang Cai, Zehong Pang and Peng Ding



22163

Tailoring the electronic configurations of YPC₂ on Cu(111): decoupling strategies for molecular spin qubit platforms

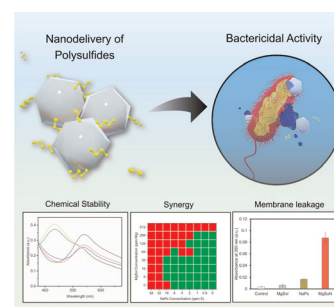
Soyoung Oh, Franklin H. Cho, We-hyo Soe, Jisoo Yu, Hong Thi Bui, Lukas Spree, Caroline Hommel, Won-Jun Jang, Soo-hyon Phark, Luciano Colazzo, Christoph Wolf* and Fabio Donati*



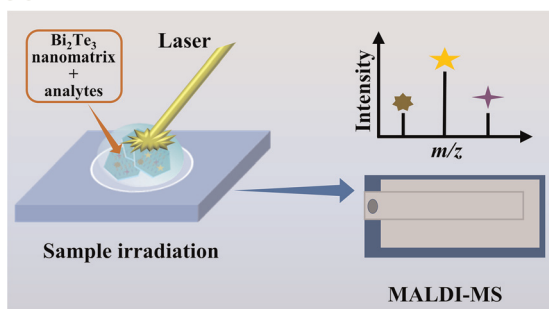
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Mechanistic insights into the synergistic antimicrobial activity of nanodelivered sodium polysulfide as a sustainable strategy to combat *Xanthomonas* pathogens

Jorge Pereira,* Edwin Davidson, Melissa M. Deinys, Allison Lloyd, Preeti Maiti, Javier Rivera-Huertas, Atiya Banerjee, Shengli Zou, Bradley Demosthene, Laurene Tetard and Swadeshmukul Santra*



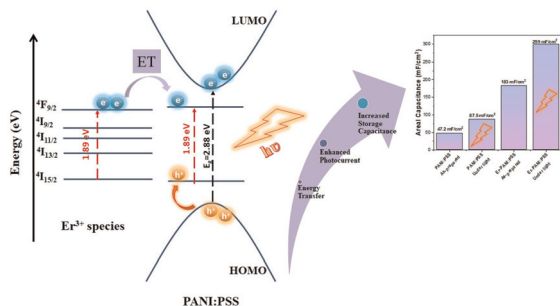
22190



Integration of Bi_2Te_3 nanosheets with laser desorption/ionization mass spectrometry for sensitive glucose detection in soft drinks

Muhammad Umar, Govinda Mandal,* Rui Lv, Ruo Chen Guo, Shunli Yang, Gang Lang, Muhammad Awais, Kashmala Gul, Muhammad Sajjad Ul Hasan and Jian Liu*

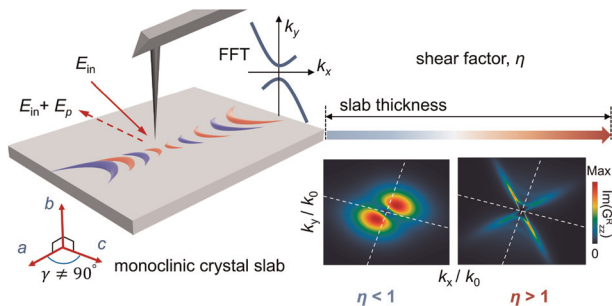
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Harnessing light in tandem: advanced erbium-polyaniline QD composites for next-generation energy storage

Marwa Ennouri,* Jan Svoboda, Zuzana Morávková, Jiřina Hromádková and Elena Tomsik*

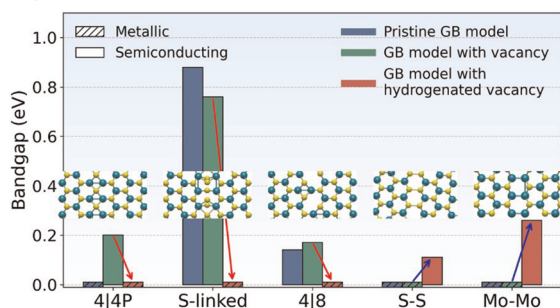
22218



Analyzing and quantifying symmetry breaking of anisotropic shear polaritons in monoclinic crystal slabs

Shuo Chen, Xiaoxue Wang, Ceji Fu* and Guangwei Hu*

22226



Defect engineering and hydrogen-induced reversibility in metallic states of MoS_2 grain boundaries

Hangbo Zhou,* Viacheslav Sorkin, ZhiGen Yu, Kah-Wee Ang and Yong-Wei Zhang*

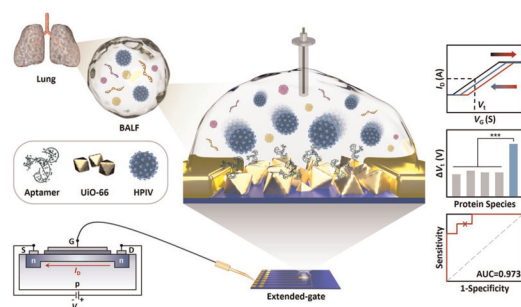


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A rapid extended-gate field-effect transistor-type biosensor composed of a truncated DNA aptamer and UiO-66 metal–organic framework nanoparticles for HPIV detection in bronchoalveolar lavage fluid

Siyun Lee, Nayeon Kwon, Yejin Yoon, Jinho Yoon, Jong Geol Jang, Wonhwa Lee,* Jin-Ho Lee,* Chulhwan Park* and Taek Lee*

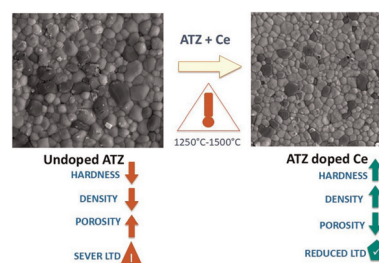


22248

Enhancing the hydrothermal aging resistance of alumina-toughened zirconia via cerium oxide doping

Mohamed Abbas,* Teeba Ali Mare, Lana Ghazal, Sjoood Makeen, Rowa Mohamed and Maryam Al-Ejji

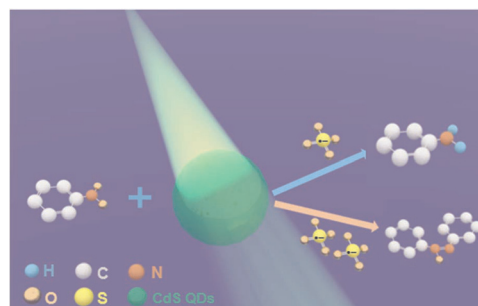
Enhancing the Hydrothermal Aging Resistance of Alumina-Toughened Zirconia via Cerium Oxide Doping



22260

Hole scavenger concentration dependent photoreduction pathway of nitrobenzene catalyzed by CdS quantum dots

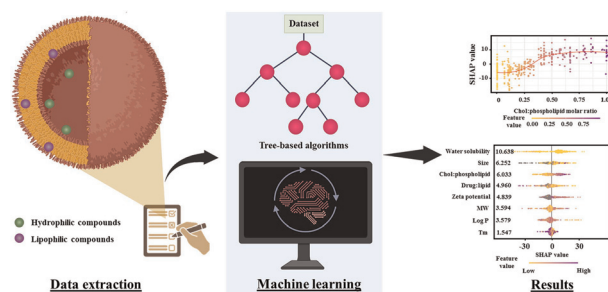
Chao Wang, Hawi N. Nyiera, Charlotte Fuqua, Courtney Brea, Guoxiang Hu, Tomoyasu Mani and Jing Zhao*



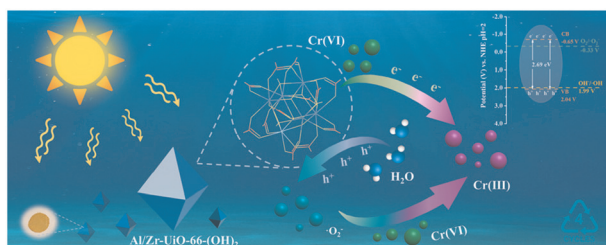
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Leveraging ensemble machine learning models (XGBoost and random forest) and genetic algorithms to predict factors contributing to the liposomal entrapment of therapeutics

Fatemeh Khodadadi, Fatemeh Taghizadeh, Ali Hashemi Baghi, Seyed Mohammad Ayyoubzadeh, Simin Dadashzadeh and Azadeh Haeri*



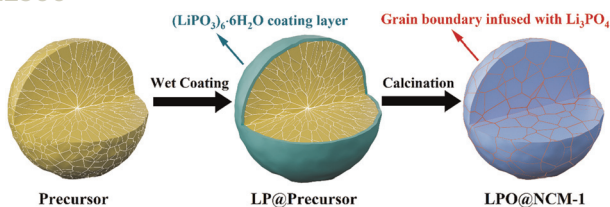
22291



Constructing bimetalization and hydroxylation in metal–organic framework for efficient Cr(vi) photoreduction

Yunzi Wang, Junyu Chen, Chongyu Li, Quanqi Yang and Jianjun Wang*

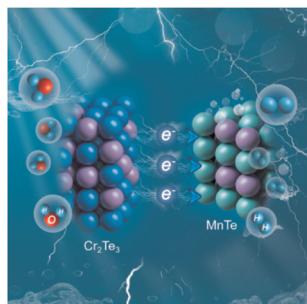
22300



Enhancing the stability of a polycrystalline Ni-rich material upon cycling with an inorganic Li⁺ conductor binder

Kui Meng, Sudan Jin, Jie Chen and Xueyi Guo*

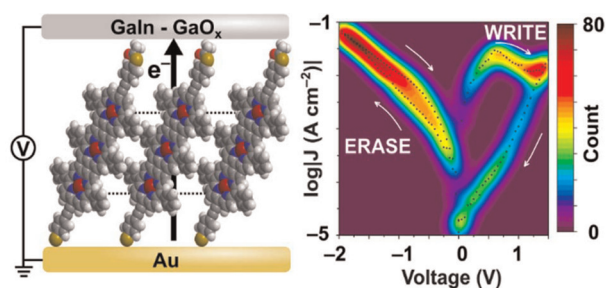
22307



Tailoring electron redistribution and hydrogen adsorption in an epitaxial MnTe/Cr₂Te₃ semiconductor/metal heterojunction for highly efficient hydrogen evolution catalysis

Hao Han, Huan Yang* and Shichuang Liu

22315



Two-terminal analog memory comprising self-assembled monolayers of edge-fused porphyrin oligomers

Xinkai Qiu, Jie-Ren Deng, G. Andrew D. Briggs, Harry L. Anderson* and James O. Thomas*

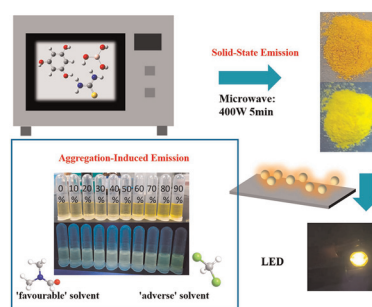


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Charge transfer-mediated fluorescence kinetics of yellow AIE carbon-dots for solid-state optoelectronic applications

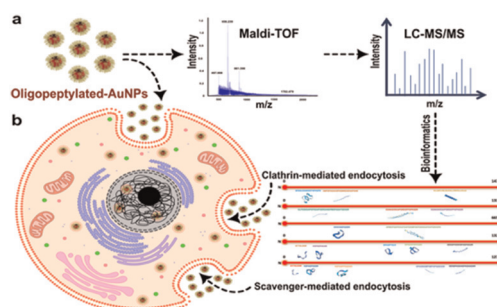
Canpu Yang, Jiusheng Hu, Yipeng Zheng, Wenjiang Tan,*
Jinhai Si and Xun Hou



22334

Unravelling the molecular armor, cellular dynamics and nuclear trafficking of ultra-stable oligopeptylated-AuNPs: PEG-rivalling nanocargos

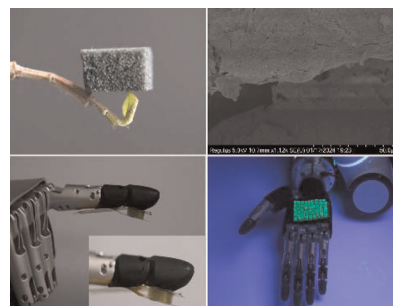
Salman Khan, Chandra S. Bhatt, Veda V. Dasari and
Anil K. Suresh*



22349

A flexible tactile sensor with decoupled multimodal sensing capacity based on melamine sponge-MXene@CsPbBr₃ aerogel

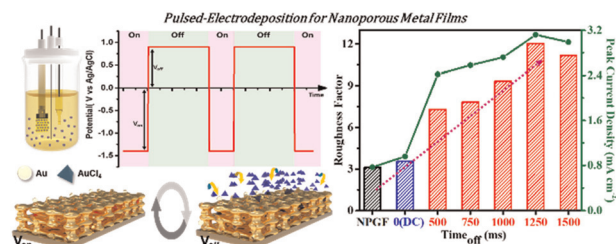
Ying Cao, Shihao Deng, Shuang Xia, Ju Bai, Shen Yuan,
Ting Zhang* and Tie Li*



22361

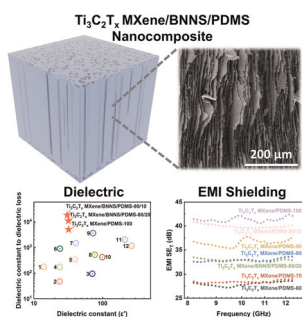
Coordination tuning of nanoporous metal films by secondary electrodeposition to optimize methanol electrooxidation activity

Yeonggun Moon, Jinbo Kim, Jisoo Park, Kahyun Kim,
Goomin Kwon and Jeonghun Kim*



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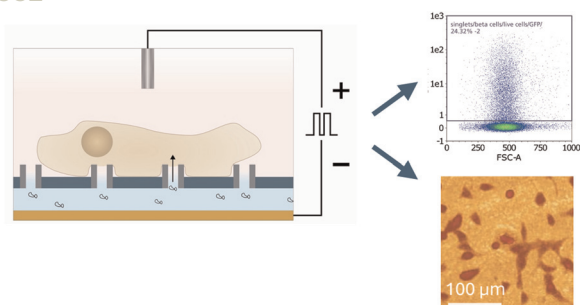
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Multifunctional $\text{Ti}_3\text{C}_2\text{T}_x$ MXene/boron nitride nanosheet/polydimethylsiloxane nanocomposites with integrated dielectric and electromagnetic interference shielding performance

Zifu Zhu, Dan Liu,* Jie Xue, Yuxuan Sun, Chuanbing Li, Jinyi Wu and Qingbin Zheng*

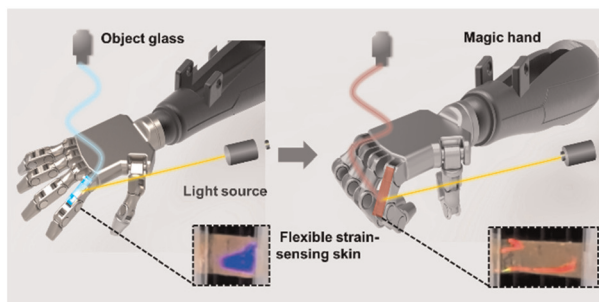
22382



Plasmid-induced cytotoxicity revealed by nanopore and nanostraw electroporation

Frida Ekstrand, Sara Davidsson Bencker, Sabrina Ruhrmann, Yupeng Yang, Charlotte Ling and Christelle N. Prinz*

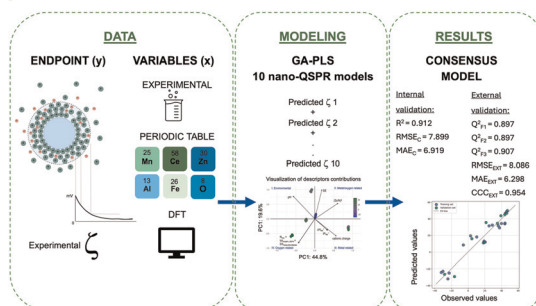
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Wireless flexible strain sensing skin based on structural color visual sensing

Haixia Yao, Jingang Wang, Lina Sun,* Jianchen Zheng, Gaolong Yuan and Hongji Guo*

22404



A rapid technique for approximating the zeta potential of metal oxide nanoparticles based on pH measurement and machine learning nano-QSPR models

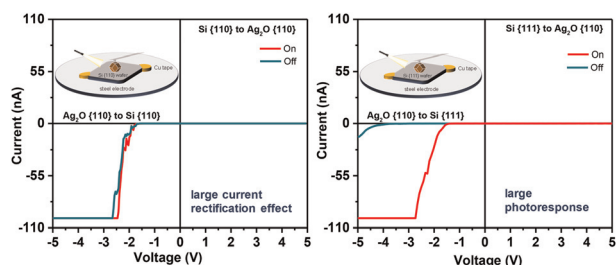
Natalia Bulawska, Michal Kalapus, Anita Sosnowska* and Tomasz Puzyn*



22414

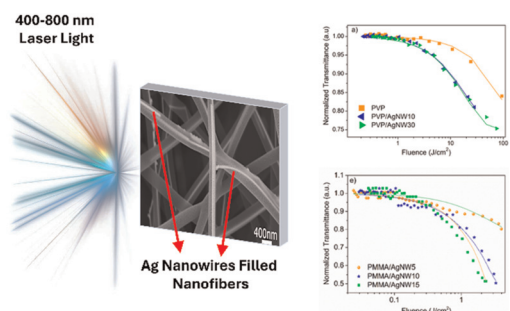
Interface-controlled Ag_2O –Si wafer heterojunctions showing current rectification and light-responsive conductivity

Vandana Meena and Michael H. Huang*



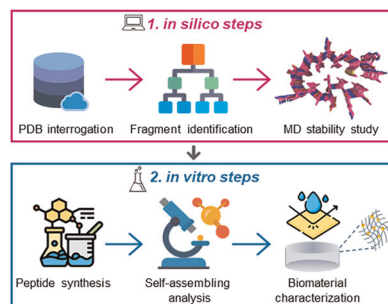
22422

Plasmon-enhanced broadband visible-light optical limiter with low threshold in silver nanowire filled electrospun nanofibers

Nur Unal, Yasemin Pepe, Serife Akkoyun,*
Elif Akhuseyin Yildiz, Onuralp Cakir, Ahmet Karatay,*
Husnu Emrah Unalan* and Ayhan Elmali*

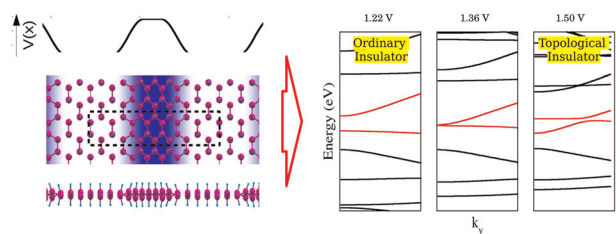
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Structural and functional characterization of self-assembling fragments identified from the transthyretin amyloid-like structure

Mariantonietta Pizzella, Antonella Accardo,
Flavia Anna Mercurio, Teresa Sibillano, Enrico Gallo,
Giancarlo Morelli, Giovanni Smaldone, Cinzia Giannini,
Marilisa Leone, Nicole Balasco,* Carlo Diaferia* and
Luigi Vitagliano

22456

Robust electro-mechanical actuation in hydrogenated Xenes leading to reversible topological transition

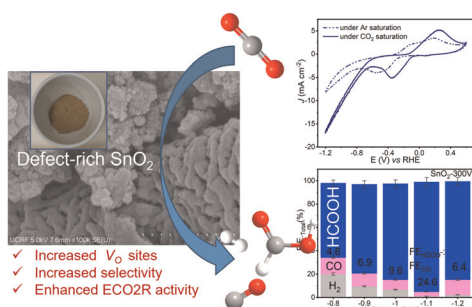
Sujith Nedungattil Subrahmanian,* Nabendu Mondal
and Joydeep Bhattacharjee

Reversible onset of Topological Insulating phase through in-plane electro-mechanical actuation



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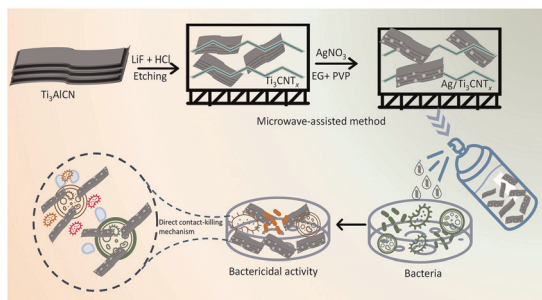
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Tailoring defect generation in SnO₂ nanostructures for increased selectivity in electrochemical CO₂ reduction

Aniruddha Jaiswal, K. S. S. V. Prasad Reddy, Sung Gu Kang, Rajeev Kumar and Seung Hyun Hur*

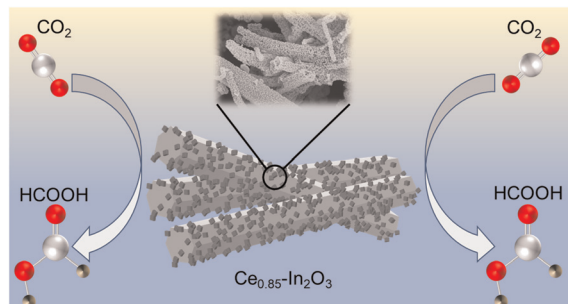
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Microwave-assisted growth of Ag nanoparticles on Ti₃CNT_x MXene for antibacterial food packaging

Madhurya Chandel,* Michał Jakubczak, Muhammad Abiyyu Kenichi Purbayanto, Agnieszka Górnik, Weronika Basior, Dorota Moszczyńska, Anika Tabassum, Michael Naguib and Agnieszka Maria Jastrzębska*

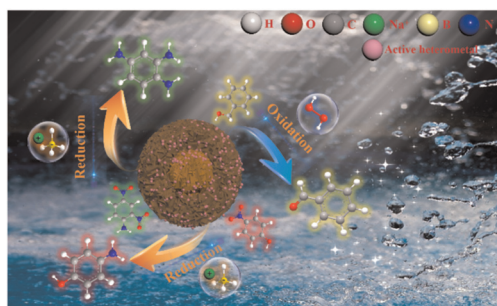
22496



Controlled cerium doping in In₂O₃ derived from an In-MOF to boost electrocatalytic CO₂ reduction for selective formate production

Shao-Xia Wang, Fang-Fang Wang and Wei-Yin Sun*

22504



General synthesis of core-shell FeAlO_x nanosphere-based nanoreactors with enhanced catalytic performance

Shun Zhao, Pei Liu, Ping Li, Jiangbo Xi,* Liangsong Wen* and Shuai Wang*

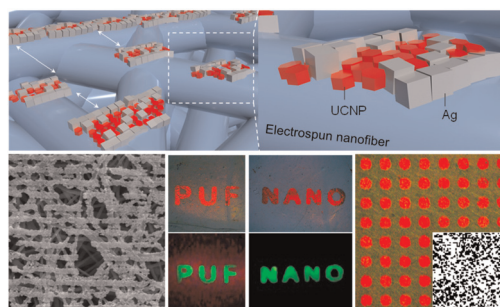


PAPERS

22513

Hierarchical assembly of upconversion nanoparticle–grating hybrids on flexible nanofibers for multi-level physical unclonable functions

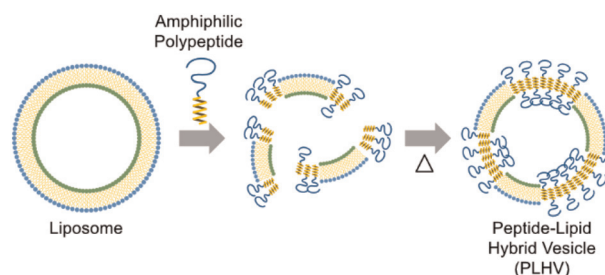
Xianrui Meng, Shunfei Qiang, Jiaqi Li, Jeong Jin Kim, Manman Zhang, Chiyu Wang, Zifan Ye, Yuhui Cao,* Wenkai Zhang* and Gil Ju Lee



22529

Fabrication of polymersomes with liposome-extracted lipid membrane preserving original leaflet asymmetry

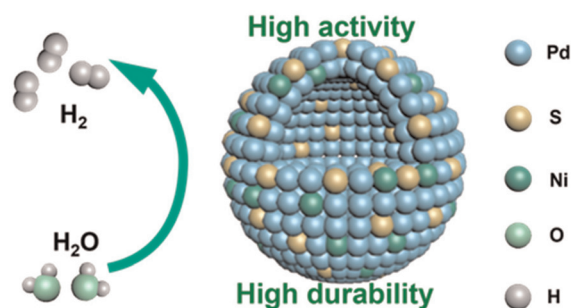
Mohammed A. Abosheasha, Yoshihiro Ito and Motoki Ueda*



22540

Coupling alloying and doping strategies to improve and stabilize Pd-based catalysts for acidic hydrogen evolution

Ligang Chen, Yazhou Zhang, Donghui Sui and Juntao Zhang*



CORRECTIONS

22546

Correction: Distinct autophagy-inducing abilities of similar-sized nanoparticles in cell culture and live *C. elegans*

Qin Wang, Yanfeng Zhou, Rong Fu, Yi Zhu, Bin Song, Yiling Zhong, Sicong Wu, Yu Shi, Yanyan Wu, Yuanyuan Su, Huimin Zhang* and Yao He*



CORRECTIONS

22548

Correction: Recent advances in nanoporous NO_x gas sensors: synergizing Raman spectroscopy, IoT, and machine learning for high-performance detection

Vikas Yadav, Naveen Kumar Arkoti, Shivam K. Gautam, Suresh Kuppireddy, Taraka Prabhu Yendrapati, Sudhakar Modem, Chandrabhas Narayana, Hi-Deok Lee,* Soumik Siddhanta* and Kolleboyina Jayarmaulu*

