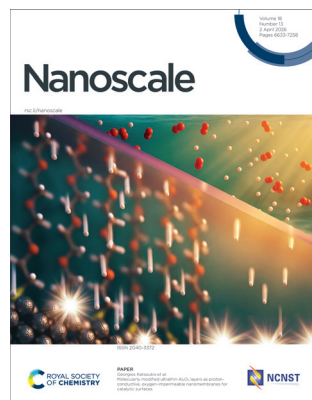


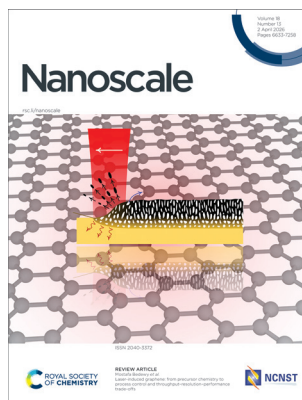
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ISSN 2040-3372 CODEN NANOHL 18(13) 6633-7258 (2026)



Cover
See Georgios Katsoukis *et al.*, pp. 6894–6905.

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See Mostafa Bedewy *et al.*, pp. 6647–6686.

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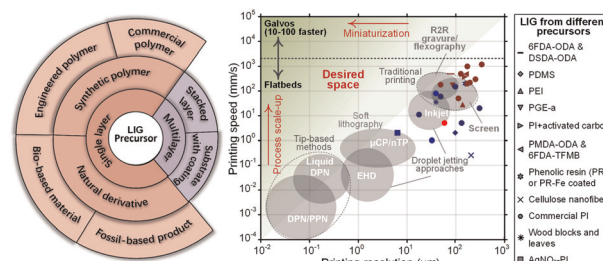
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REVIEWS

6647

Laser-induced graphene: from precursor chemistry to process control and throughput–resolution–performance trade-offs

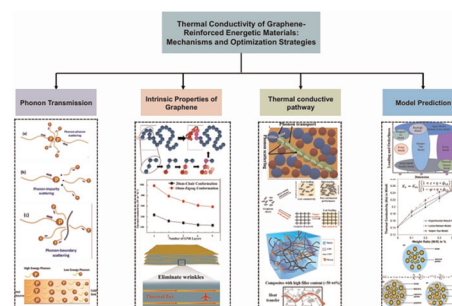
Zhenhao Wu, Mirza Sahaluddin, Diala Bani Mustafa, Soumalya Ghosh and Mostafa Bedewy*



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Thermal conductivity of graphene-reinforced energetic materials: mechanisms and optimization strategies

Shihui Fu, Yuhan Zhou, Kang Xu, Gang Huang, Zhikang Wang, Yuxiang Ni, Xin Huang, Chaoyang Zhang and Yanqing Wang*



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Fundamental questions
Elemental answers

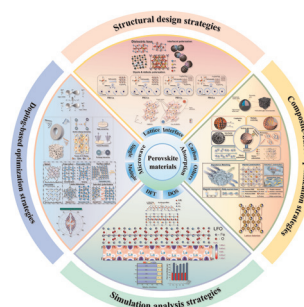


REVIEWS

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Recent advances in perovskite-derived microwave absorption materials

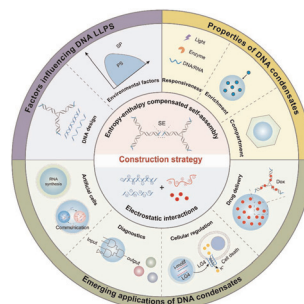
Yu-Kai Luo and Ming Wang*



6748

Advances in the construction and biological applications of DNA condensates

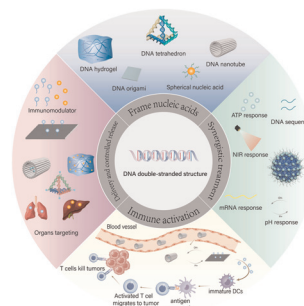
Mei Dai, Xiaoqing Li, Xuemei Jia, Hongjing Dou, Xiaocui Guo,* Chi Yao* and Dayong Yang*



6768

Leveraging DNA-based biomaterials for advanced cancer immunotherapy

Zhenyu Lu, Jifeng Li, Kai Li, Lianhui Wang, Ziliang Dong* and Qin Fan*

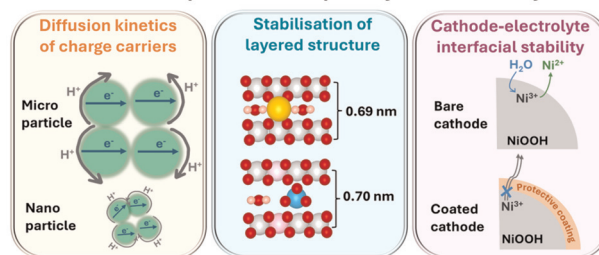


6787

Prospects for high-valent nickel oxides as next-generation cathodes in primary alkaline batteries

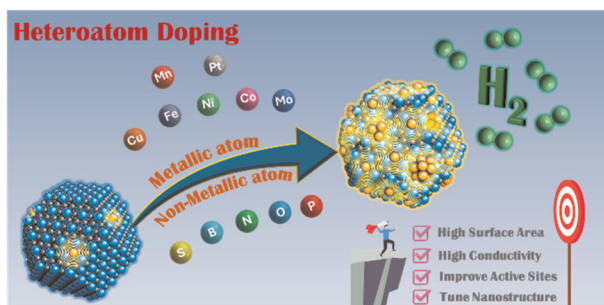
Deepika Ranganathan, Yi Cai and Madhavi Srinivasan*

Nanoscale phenomena in primary alkaline battery



REVIEWS

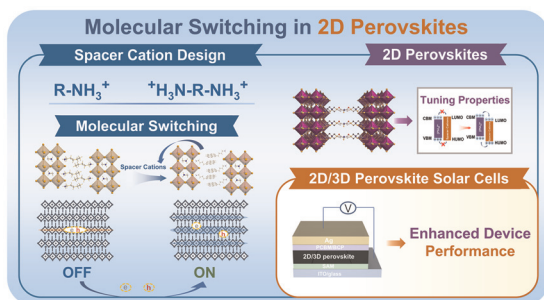
6812



Synergistic effects of metallic and non-metallic element-doped electrocatalysts for the hydrogen evolution reaction: a review

Manova Santhosh Yesupatham, Rajini Murugesan, Donald Richard, Akshaya Radhakrishnan and Arthanareeswari Maruthapillai*

6860

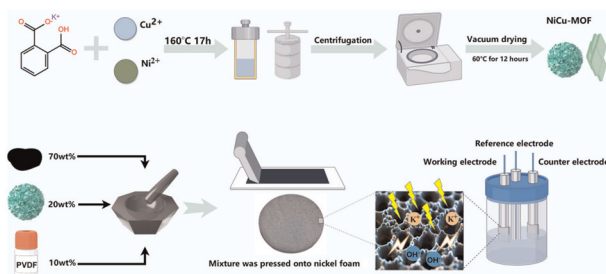


Spacer cations: molecular switches for 2D and 2D/3D perovskite photovoltaics

Guiran Gao, Haodong Yan, Wenzhen Lv, Mingguang Li, Junmin Xia, Aijie Zhou, Ke Guo,* Runfeng Chen* and Guangbao Wu*

COMMUNICATION

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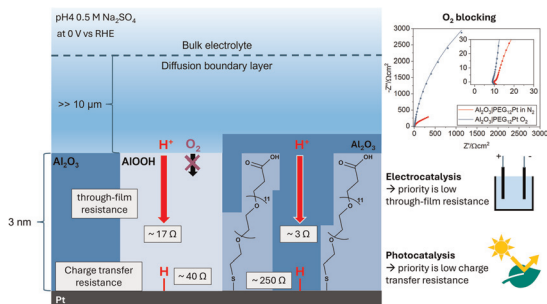


Potassium-intervened copper–nickel bimetallic organic framework with a potassium hydrogen phthalate ligand for high-performance aqueous potassium-ion hybrid supercapacitors

Zhixin Shi, Jing Guo, Bo Yang, Chunying Tao, Ao Zheng, Menglei Sun and Xudong Yang*

PAPERS

6894



Molecularly modified ultrathin Al₂O₃ layers as proton-conductive, oxygen-impermeable nanomembranes for catalytic surfaces

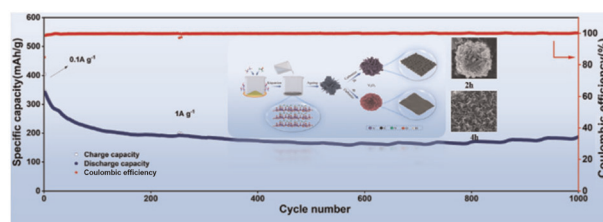
Dalia Leon-Chaparro, Christos Englezos, Bastian Mei, Guido Mul and Georgios Katsoukis*



6906

Microstructure-regulated V_2O_5 cathodes for high-rate and durable aqueous zinc-ion batteries

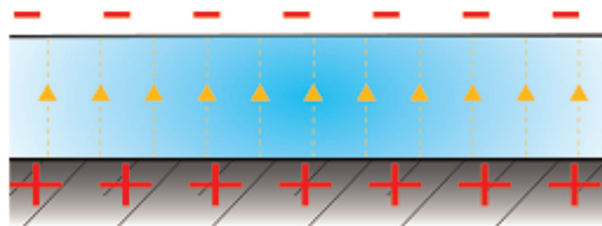
Tingting Cai, Shuangshuang Zhao, Qin Fang, Huixin Chen, Xiuli Jia* and Dongxu Yu*



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Spontaneously polarised crystalline water ice

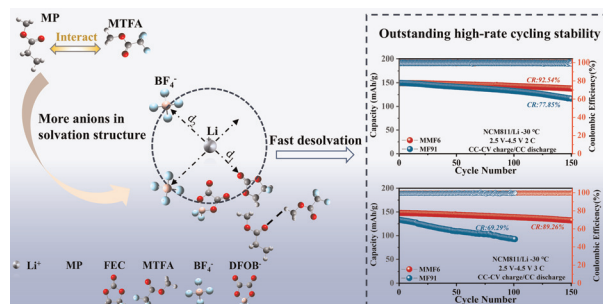
Rachel L. James, Frank P. Pijpers, Lars Borchert, David Field and Andrew Cassidy*



6923

Solvent-association regulated electrolyte enables high-rate lithium metal batteries at low-temperature

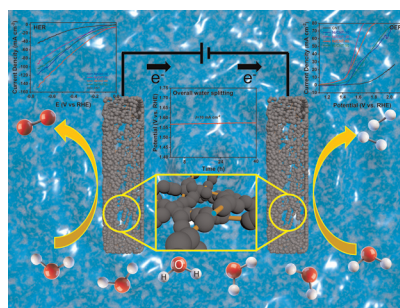
Xuanyuan Liao, Qiao Luo, Zhengzhao Yang, Yaqing Wu,* Xiangsheng Hong, Rui Zhao, Xiaowei Huang, Xiaowei Tang, Liangjun Zhou* and Weifeng Wei



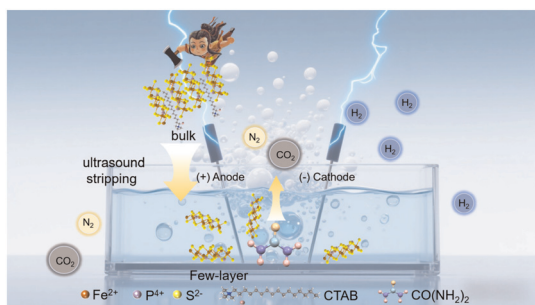
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Nickel nanoparticle anchored 3D carbon nanotube sponge: a free-standing catalyst electrode for efficient water splitting

Zhaoyun Lin, Junge Yuan, Weixue Meng, Ding Zhang, Yuxin Chen, Yan Zhang, Fengmei Guo, Jie Xu,* Yingjiu Zhang* and Yuanyuan Shang*



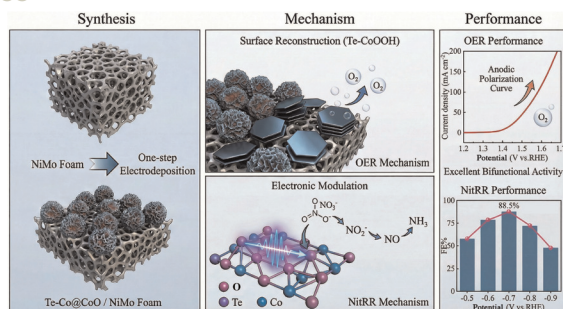
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Regulating the layered structure of 2D FePS₃ to achieve high-performance electrocatalytic urea degradation

Jiaxin Liu, Ke Wang, Tongtong Yu, Zhongkang Cao, Shangyun Chen, Xu Zhang, Peiyu Wang, Bingjun Yang, Juan Yang, Huiju Wang* and Pengjun Ma*

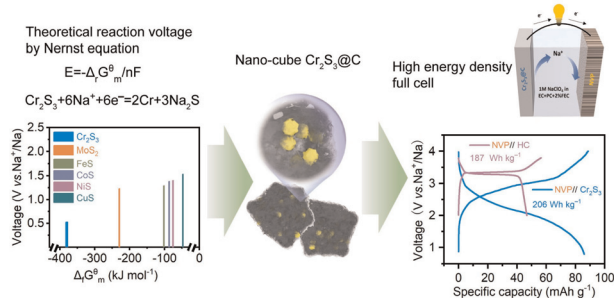
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A Te-doping strategy in Co@CoO for concurrent enhancement of oxygen evolution and nitrate reduction reactions

Wenbin Wang,* Wei Yang,* Xin Yu, Tao Long, Sha Deng, Chu Guo, Haodong Sun and Hongwu Zhang

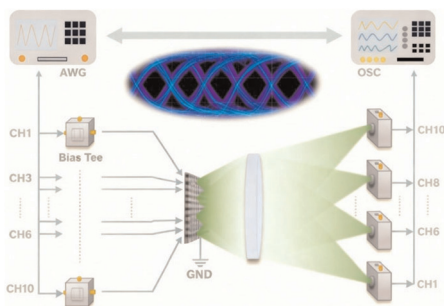
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Unlocking high-voltage sodium ion batteries with MOF-derived Cr₂S₃@C anode materials

Mingqing Sun, Zhiyuan Li, Mei Yang,* Meng Xu, Xiaoqing Chang, Jianghua Wu, Liuqi Wang, Xingyu Wang, Tingting Chen, Qiuying Xia* and Hui Xia*

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InGaN/GaN multi-quantum well LED array for short-distance optical links

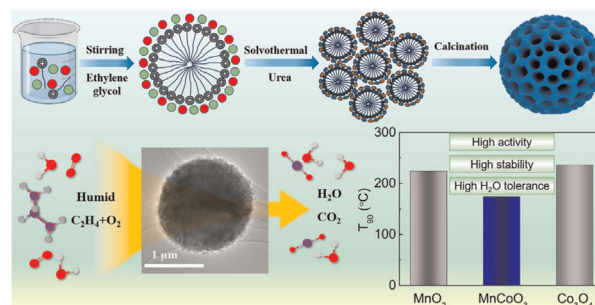
Xueyao Lu, Xumin Gao, Xiaoxuan Wang,* Yang Chen, Xin Li, Fan Shi, Fang Liu, Xu Wang,* Feifei Qin* and Yongjin Wang*



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Solvothermal synthesis of spherical CoMnO_3 catalysts for efficient trace ethylene removal under high humidity

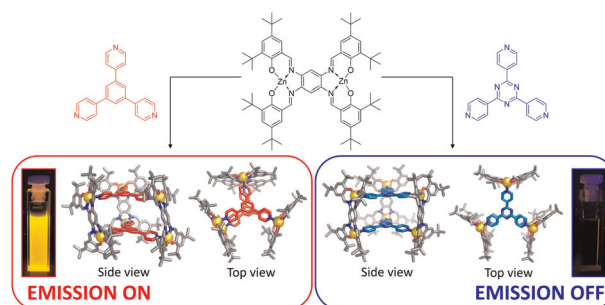
Mingjie Zhao, Qiaofei Zhang,* Jiayin Liang, Liwen Zhang, Jianfei Gao, Jurakhonzoda Rauf Jurakhon, Chunshan Zhu* and Chunzheng Wang*



7002

The bis-salphen Zn(II) unit: a versatile building block for self-assembled heteroleptic coordination cages

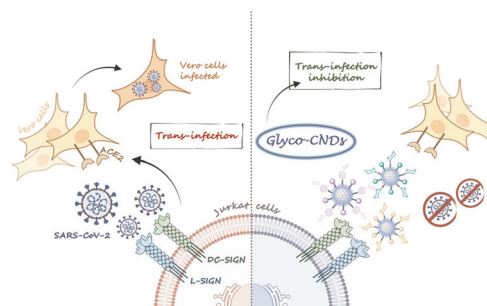
Leonardo Donaggio, Kristian Schweimer, Frank W. Heinemann, Janosch Hennig and Hannah Kurz*



7010

Glycosylated carbon nanodots as multivalent blockers of lectin-driven viral entry: structural insights and antiviral performance

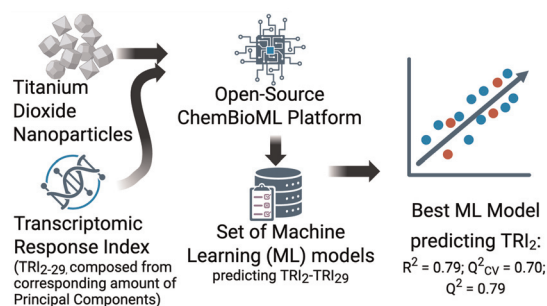
Gema Nieto-Ortiz, Justo Cabrera-González, Fátima Lasala, Laura Rodríguez-Pérez, David Valdivieso González, Iván López-Montero,* Rafael Delgado,* Nazario Martín,* M. Ángeles Herranz* and Beatriz M. Illescas*



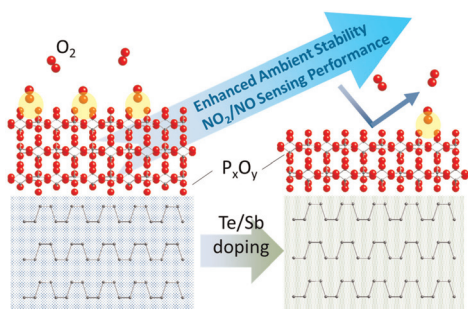
7021

An integrative omics-machine learning framework for predicting pulmonary responses to titanium dioxide nanoparticles

Viacheslav Muratov, Karolina Jagiello* and Tomasz Puzyn*



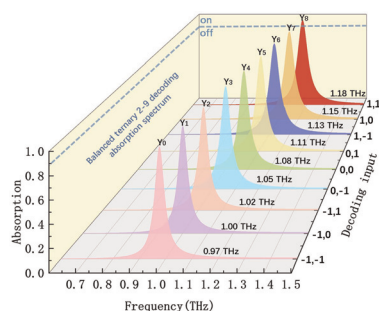
7034



Heteroatom-engineered black phosphorus nanosheets with ambient stability for selective NO₂/NO detection

Yen-Ling Wang, Yi-Ting Wu, Shih-Syuan Huang, I-Jung Wang and Chun-Hua Chen*

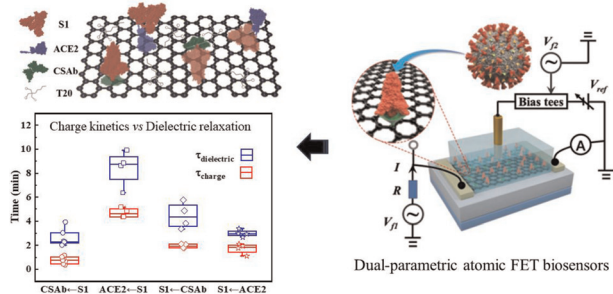
7045



A balanced ternary 2–9 decoder based on a terahertz metasurface and its sensing applications

Aijun Zhu,* Wenrui Wei, Weigang Hou* and Cong Hu*

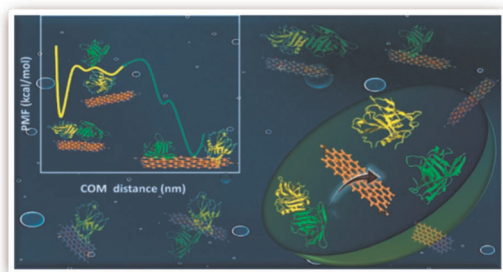
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Probing charge and dielectric relaxation in protein interactions using atomic field-effect transistor biosensors

Lei Bao, Xiaoyan Zhang,* Shen Ao, Qiushi Jing, Lishuang Wang, Zhihong Zhang, Mingchao Ding, Muhong Wu, Kaihui Liu, Grégory F. Schneider, Weipeng Wang, Yunhan Ling, Zhengjun Zhang and Wangyang Fu*

7067



Unraveling the mechanism of graphene oxide-mediated disruption of protein dimers

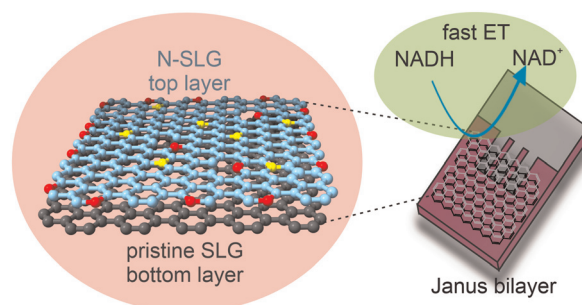
Jyoti Vishwakarma, Dineshbabu Takkella, Sudhanshu Sharma, Abhinav Srivastava, Jacek Czub, Subrahmanyam Sappati,* Kolleboyina Jayaramulu* and Krishna Gavvala*



7080

Intrinsic electrocatalytic activity of nitrogen-doped monolayer graphene observed using a Janus bilayer design

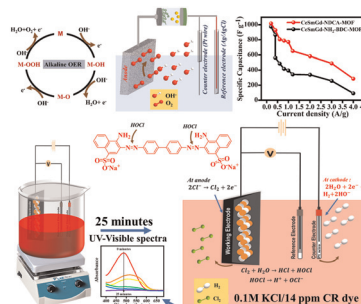
Gloria Alexander, Tobias Grosser, Cathy Sulaiman, Raquel Sánchez-Barquilla, Emil Fuhry, Isabell Wachta, Robert Jungnickel, Jan Ingo Flege and Kannan Balasubramanian*



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Enhancing the electrocatalytic potential of trimetallic CeSmGd-MOFs for oxygen evolution reaction, supercapacitor, and dye degradation applications

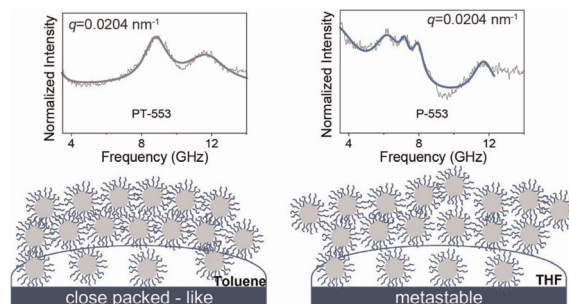
Muhammad Zia Ur Rehman Farooqi, Khalid Mahmood,* Muhammad Tariq, Ajaz Hussain, Hafiz Muhammad Asif, Muhammad Ali Khan, Muhammad Hanif,* Muhammad Awais Mughal, Aysha Arshad and Muhammad Rafiq*



7118

Process-dependent hypersonic phonon dispersion of brush particle metamaterials

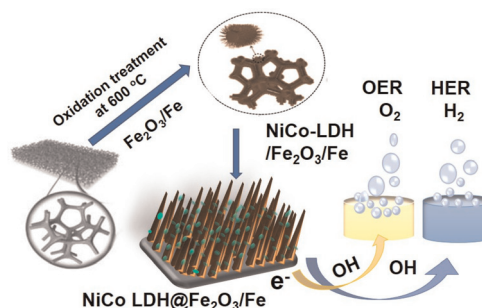
Qiqi Li, Iyad Ramdane, Jirameth Tarnsangpradit, Pascal Rembert, Rebecca Sainidou, Yu Cang, Krzysztof Matyjaszewski, Michael R. Bockstaller, Bartłomiej Graczykowski and George Fytas*



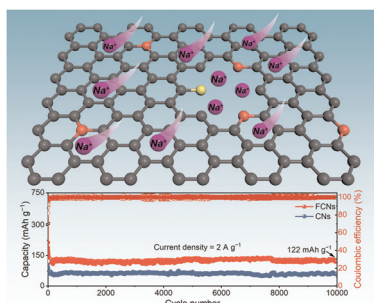
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Nano-whiskers of Fe₂O₃ coated with NiCo LDH grown on an iron foam substrate for overall water splitting

Samina Hameed, Xiaolong Liang, Yousaf Khan, Ihtisham Ahmad Butt, Xueliang Mu* and Jinxuan Liu*



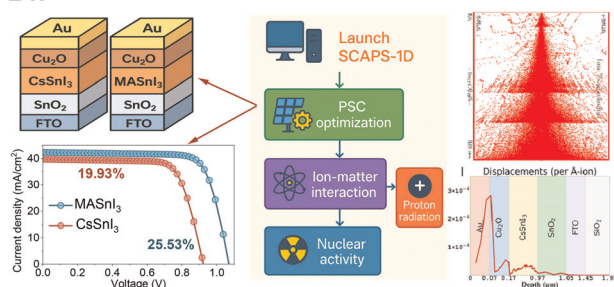
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Regulating sodium storage sites in carbon materials via fluorine doping for sodium-ion batteries

Zhiqiang Li, Jiayao Yu,* Ge Yao and Fangcai Zheng*

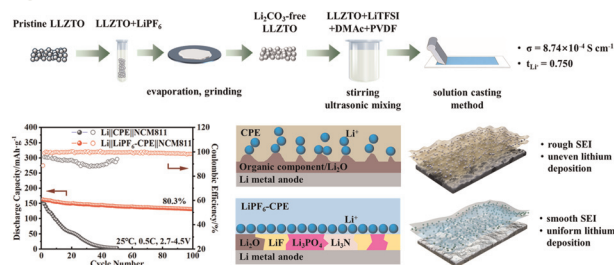
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Multiscale simulation of eco-friendly perovskites under space radiation

Mustafa Kareem,* Bassam Thaban, Asha Rajiv, Badri Narayan Sahu, Sridharan Sundharam and Prakhar Tomar

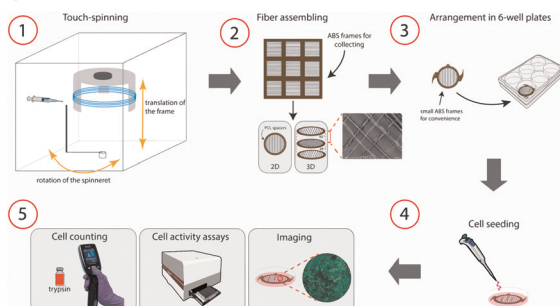
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Dual-interfacial engineering via LiPF₆ treatment: eradicating Li₂CO₃ on LLZTO and regulating SEI for high-voltage solid-state batteries

Jiapei Sun, Leipeng Leng, Tao Sun, Yizhuo Liu, Yawen Guo, Xiaopeng Cheng,* Yuefei Zhang and Xianqiang Liu*

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Evaluating the efficiency of touch-spun scaffolds in producing dense cell cultures for tissue engineering applications

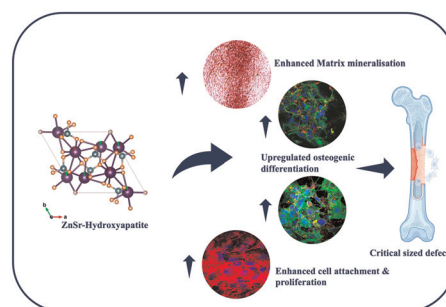
Kristina Peranidze, Mikhail Parker, Mohammad Aghajohari, Polina Vertegel, Sergei Makaev, Nataraja Sekhar Yadavalli, Sergiy Minko* and Vladimir Reukov*



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Engineering osteoinductive hydroxyapatite via zinc and strontium co-substitution

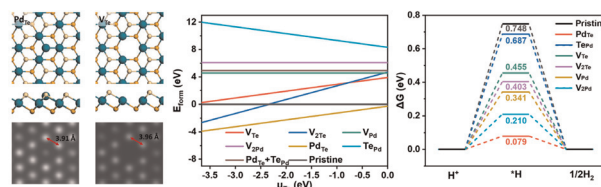
Sivaraj Durairaj,* Malika Arora, Satish Kumar, Preethi Murugesan, Juan F. Vivanco and Deepa Ghosh*



7210

Formation, electronic properties, and enhanced hydrogen evolution catalytic performance of substitutional defects in 1T PdTe₂

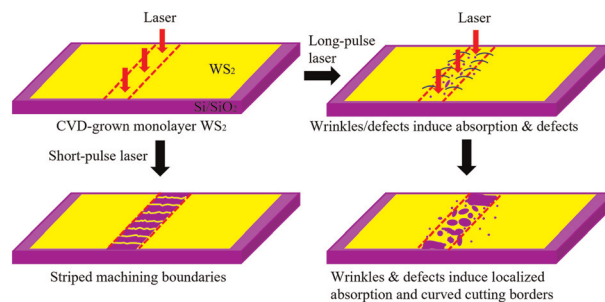
Ping Li, Rui Ma, Guowang Pang, Pan Zhang, Yabin Ma, Junliang Ma, Zeyan Zhou* and Yanjun Qin*



7218

Atomic ribbon formation in the pulsed laser patterning of WS₂ layers

Yaowu Hu,* Zifeng Wang, Zequn Zhang and Jie Guan



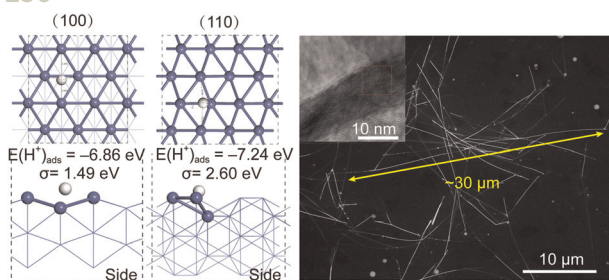
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A machine learning-assisted Ag–TiO₂ SERS platform for intraoperative osteomyelitis diagnosis

Yunfan Chen, Tengjiao Zhu, Langran Wang, Yechen Wang, Qizhao Tan, Yun Tian, Lu Zhao,* Qi An* and Gao Si*



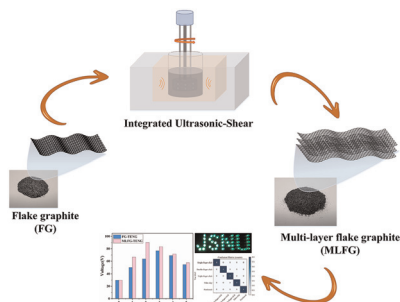
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Controllable synthesis and structural modulation of ultrafine textured cobalt nanowires

Qing Zhao, Jiayue Sun, Jiling Zhao, Changxin Qi, Ruichao Zhang, Zhaonan Yan, Wenyang Yu, Juan Wen* and Yong Qin*

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Ultrasonic-shear exfoliated multi-layer graphene flakes for enhanced triboelectric nanogenerator performance toward wearable self-powered applications

Honghao Zhang, Lele Gao, Hua Huang, You Lv, Baocheng Liu, Ping Zhang, Robert Tomala, Zhengchun Yang* and Le Zhang*

