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See Tianshou Zhao, Meisheng Han, Lin Zeng *et al.*, pp. 2216–2230. Image reproduced by permission of Tianshou Zhao from *Energy Environ. Sci.*, 2025, **18**, 2216.



Inside cover

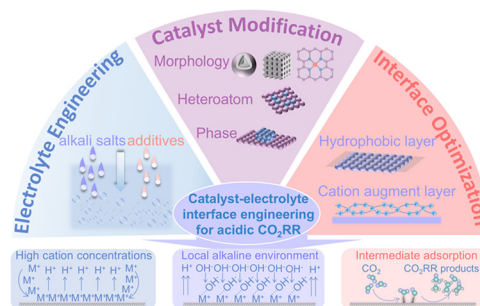
See Jili Yuan, Jun Wang, Shiwei Hu, Haibo Xie *et al.*, pp. 2231–2242. Image reproduced by permission of Jili Yuan from *Energy Environ. Sci.*, 2025, **18**, 2231.

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2025

Catalyst–electrolyte interface engineering propels progress in acidic CO₂ electroreduction

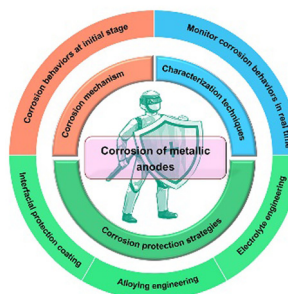
Yunling Jiang, Linsen Huang, Chaojie Chen, Yao Zheng* and Shi-Zhang Qiao*



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Corrosion of metallic anodes in aqueous batteries

Xuejin Li,* Pengyun Liu, Cuiping Han, Tonghui Cai, Yongpeng Cui, Wei Xing* and Chunyi Zhi*



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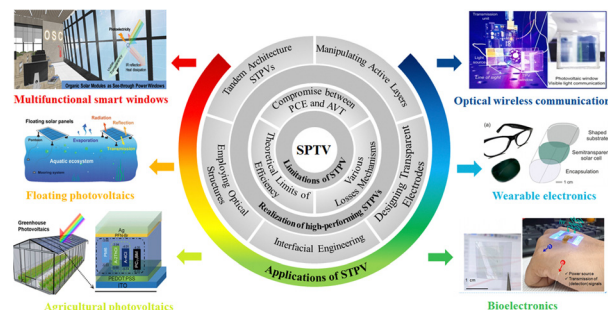
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REVIEWS

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Semi-transparent photovoltaics

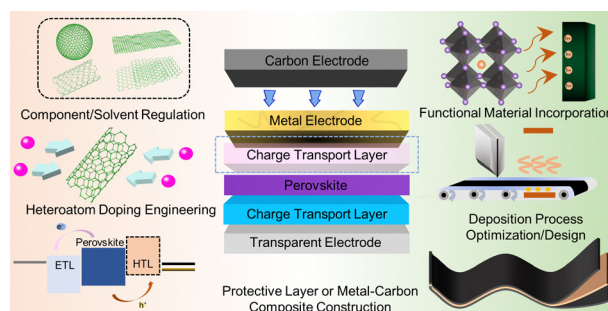
Chunyu Xu, Yifan Chen, Zijin Zhao, Bowen Yang, Jiajia Suo, Kun Ba, Alexey Tarasov, Yulun Wu, Xinxin Lian, Ming Luo, Yiqiang Zhan, Yifeng Chen, Jifan Gao, Xiaoliang Mo, Wallace C. H. Choy, Jianlu Wang, Hong Zhang* and Junhao Chu



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Advanced carbon-based rear electrodes for low-cost and efficient perovskite solar cells

Jingsheng He, Yu Bai, Zhixin Luo, Ran Ran, Wei Zhou, Wei Wang* and Zongping Shao



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Expanding the temperature range of stable aqueous batteries: strategies, mechanisms and perspectives

Xianwei Fu, Ruijuan Shi, Ye Liu, Xiaoxiao He, Qian Li, Yan Zhang, Yong Zhao* and Shilong Jiao*

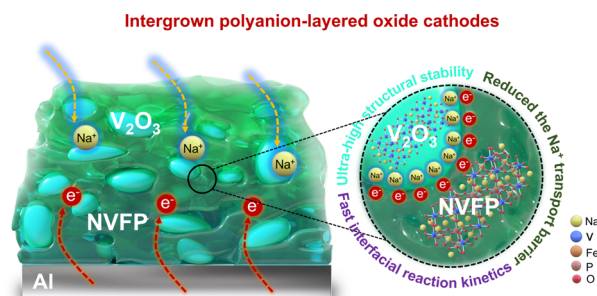


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2216

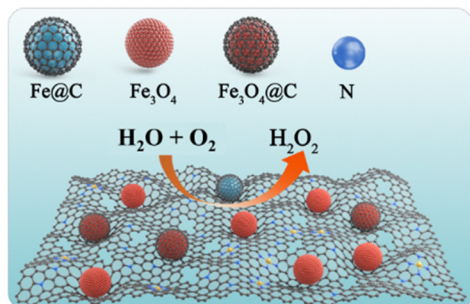
Integrated polyanion-layered oxide cathodes enabling 100 000 cycle life for sodium-ion batteries

Zhiyu Zou, Yongbiao Mu, Meisheng Han,* Youqi Chu, Jie Liu, Kunxiong Zheng, Qing Zhang, Manrong Song, Qinqing Jian, Yilin Wang, Hengyuan Hu, Fenghua Yu, Wenjia Li, Lei Wei, Lin Zeng* and Tianshou Zhao*



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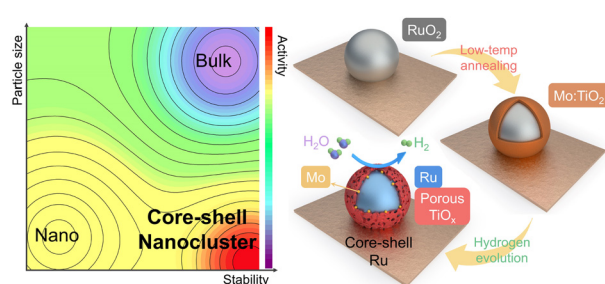
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Crystalline nitrogen-doped-carbon anchored well-dispersed Fe_3O_4 nanoparticles for real-time scalable neutral H_2O_2 electrosynthesis

Hao Yin, Jili Yuan,* Jun Wang,* Shiwei Hu,*
Pingshan Wang and Haibo Xie*

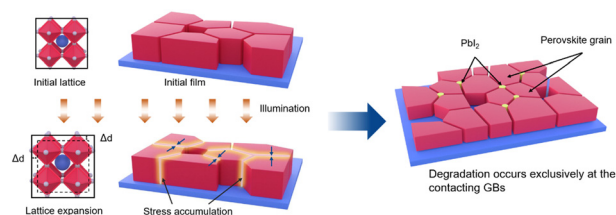
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A ruthenium–titania core–shell nanocluster catalyst for efficient and durable alkaline hydrogen evolution

Hyun Woo Lim, Tae Kyung Lee, Subin Park,
Dwi Sakti Aldianto Pratama, Bingyi Yan,*
Sung Jong Yoo,* Chan Woo Lee* and Jin Young Kim*

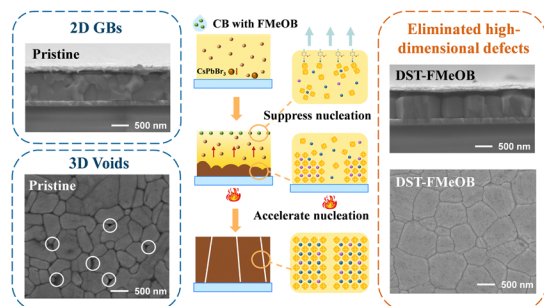
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Photomechanically accelerated degradation of perovskite solar cells

Haonan Wang, Qing Li, Yan Zhu, Xinyuan Sui, Xiulian Fan,
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Yu Zhou, Haibao Jin,* Hua Gui Yang, Yu Hou* and
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Eliminating high-dimensional defects by upward unidirectional crystallization for efficient and stable inverted perovskite solar cells

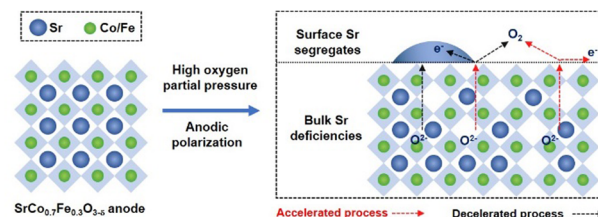
Zhenzhen Qin, Mengjiong Chen, Ziyang Zhang,
Yanbo Wang* and Liyuan Han*



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A comprehensive investigation of Sr segregation effects on the high-temperature oxygen evolution reaction rate

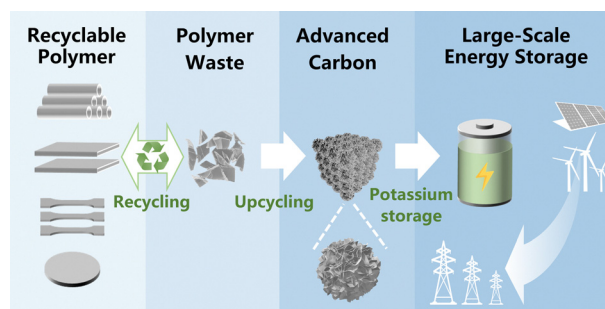
Weicheng Feng, Geng Zou, Tianfu Liu, Rongtan Li, Jingcheng Yu, Yige Guo, Qingxue Liu, Xiaomin Zhang, Junhu Wang, Na Ta, Mingrun Li, Peng Zhang, Xingzhong Cao, Runsheng Yu, Yuefeng Song,* Meilin Liu,* Guoxiong Wang* and Xinhe Bao



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A hindered-urea vitrimer: recyclable for circular use and upcyclable for rechargeable batteries

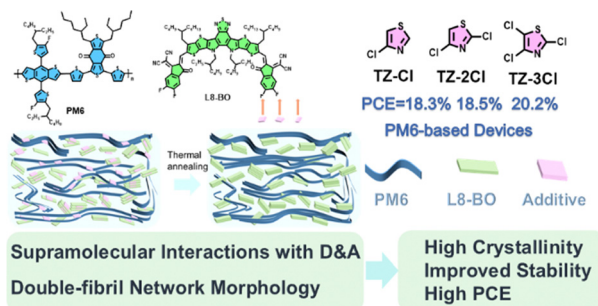
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Constructing a dual-fiber network in high efficiency organic solar cells *via* additive-induced supramolecular interactions with both donor and acceptor

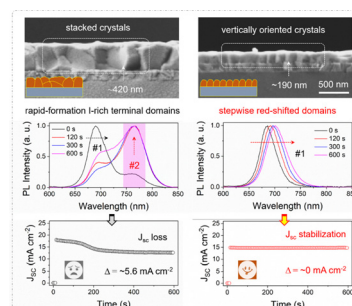
Nan Wei, Hao Lu, Yaoyao Wei, Yawen Guo, Haoming Song, Jieni Chen, Zhenyu Yang, Yetai Cheng, Ziqing Bian, Wenkai Zhang, Qiaoling Chen, Yahui Liu,* Wenchao Zhao,* Xinjun Xu* and Zhishan Bo*



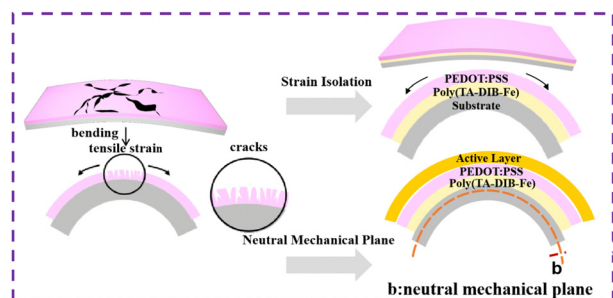
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Unveiling the impact of photoinduced halide segregation on performance degradation in wide-bandgap perovskite solar cells

Yuxiao Guo, Cong Zhang, Linqin Wang, Xingtian Yin,* Bihui Sun, Changting Wei, Xin Luo, Shiyu Yang, Licheng Sun and Bo Xu*



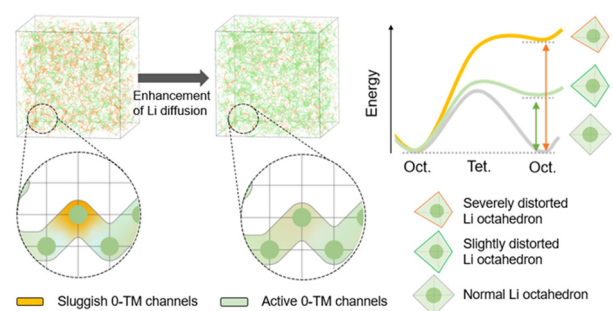
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Interface design based on strain isolation theory with an optimized neutral mechanical plane enables highly ductile and flexible organic photovoltaics

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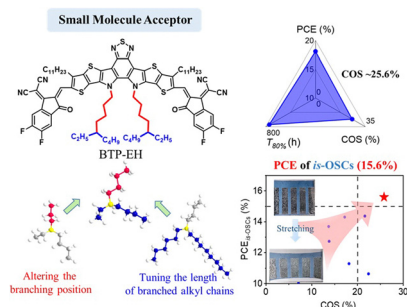
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Elucidating lithium-ion diffusion kinetics in cation-disordered rocksalt cathodes

Byungwook Kang, Jonghun Park, Byunghoon Kim, Sung-O Park, Jaekyun Yoo, Seungju Yu, Hyuk-Joon Kim, Jun-Hyuk Song and Kisuk Kang*

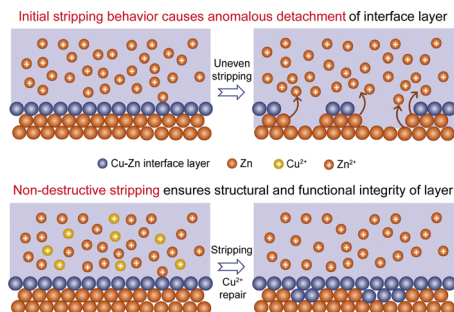
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Achieving highly efficient, mechanically robust and thermally stable organic solar cells through optimizing the branching position and side chain length of small molecule acceptors

Di Zhang, Junfeng Liu, Xiang Gao, Zhi Wang, Jiayi He, Zhenye Wang, Lvpeng Yang, Yerun Gao and Ming Shao*

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Non-destructive stripping electrochemistry enables long-life zinc metal batteries

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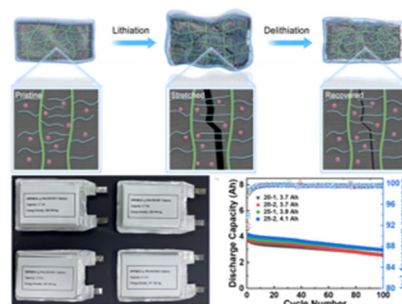


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A highly elastic and Li-ion conductive binder enables stable operation of silicon microparticle anodes in high-capacity and high-energy-density pouch cells

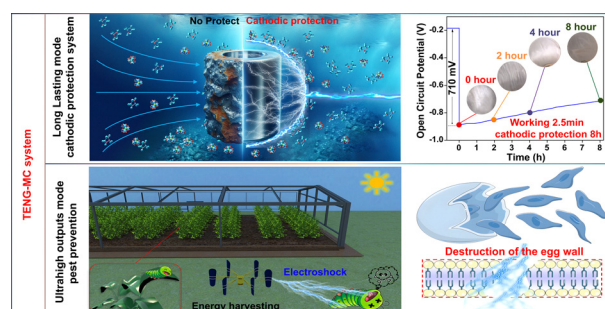
Zeheng Li,* Zhengwei Wan, Zheng Lin, Mengting Zheng,* Jianhui Zheng, Shangshu Qian, Yao Wang, Tinglu Song, Zhan Lin* and Jun Lu*



2381

Managing the two mode outputs of triboelectric nanogenerators to reach a pulsed peak power density of 31 MW m⁻²

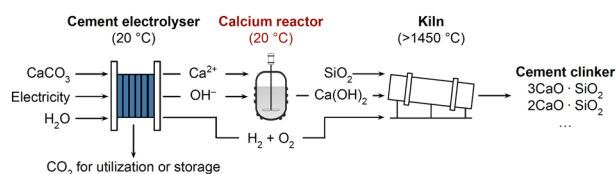
Junpeng Wu, Xiaoyi Li,* Na Xue, Jie Wang, Guoqiang Xu, Shougang Chen, Hongzhi Cui,* Yunlong Zi* and Zhong Lin Wang*



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Electrolytic cement clinker precursor production sustained through orthogonalization of ion vectors

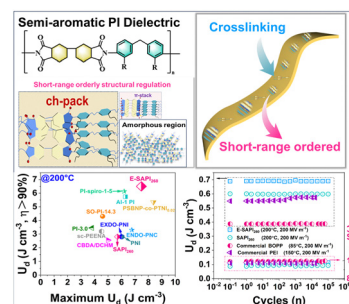
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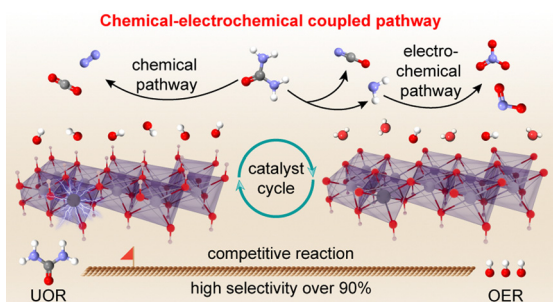
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Enhanced high-temperature energy storage in semi-aromatic polyimides via dual regulation of short-range ordered and crosslinked architectures

Guanghu He, Hang Luo,* Yuan Liu, Yuting Wan, Bo Peng, Deng Hu, Fan Wang, Xiaona Li, Jiajun Peng, Huan Wang and Dou Zhang*



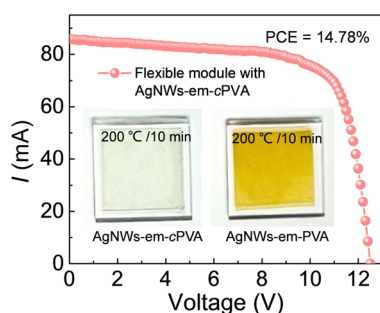
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Single-atom tungsten doping induced chemical–electrochemical coupled pathway on Ni(OH)₂ enables efficient urea electrooxidation

Lebin Cai, Haoyun Bai, Jilong Li, Feng Xie, Kang Jiang, Ying-Rui Lu, Hui Pan and Yongwen Tan*

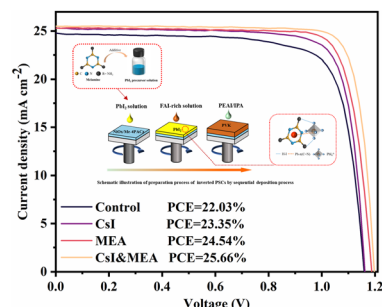
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Enhanced moisture and thermal stability of transparent electrodes via crosslinking for large-area flexible organic photovoltaic modules

Xin Lu, Yang Liu, Ruiyu Tian, Xingjie Liu, Yuanyuan Wang and Yinhua Zhou*

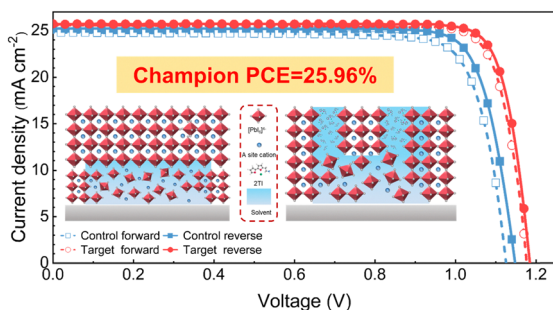
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Melamine holding PbI₂ with three “arms”: an effective chelation strategy to control the lead iodide to perovskite conversion for inverted perovskite solar cells

Shizi Luo, Shuguang Cao, Tongjun Zheng, Zhuoneng Bi, Yupeng Zheng, Yiqun Li, Biniyam Zemene Taye, Victoria V. Ozerova, Lyubov A. Frolova, Nikita A. Emelianov, Eugeny D. Tarasov, Zheng Liang,* Lavrenty G. Gutsev,* Sergey M. Aldoshin, Bala R. Ramachandran, Pavel A. Troshin* and Xueqing Xu*

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Enhanced electrical performance of perovskite solar cells via strain engineering

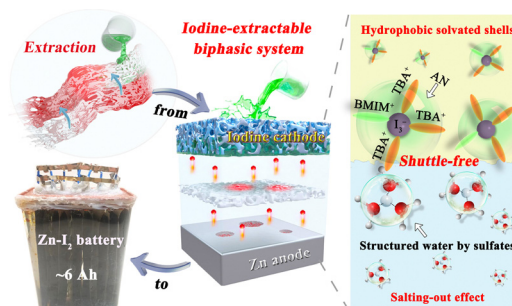
Siyang Cheng, Yuanhang Yang, Xueliang Zhu, Yahui Li, Hao Li, Wenqi Xiong, Zhuo Zheng, Sheng Li, Yong Liu, Xiaozhe Liu, Qianqian Lin, Shengjun Yuan, Enzheng Shi and Zhiping Wang*



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An integrated design for high-energy, durable zinc–iodine batteries with ultra-high recycling efficiency

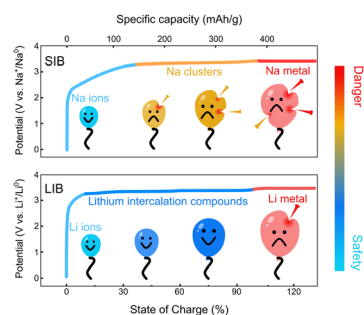
Leiqian Zhang, Han Ding, Haiqi Gao, Jiaming Gong, Hele Guo, Shuoqing Zhang, Yi Yu, Guanjie He, Tao Deng, Ivan P. Parkin, Johan Hofkens, Xiulin Fan,* Feili Lai* and Tianxi Liu*



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Sodium cluster-driven safety concerns of sodium-ion batteries

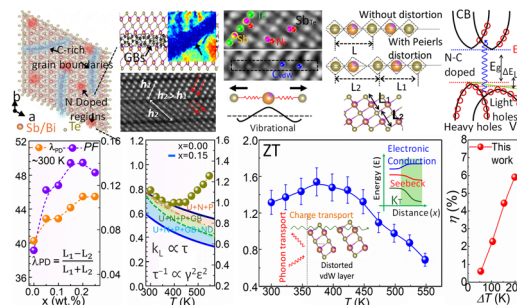
Jiaping Niu, Junyuan Dong, Xiaohu Zhang, Lang Huang,* Guoli Lu, Xiaolei Han, Jinzhi Wang, Tianyu Gong, Zheng Chen, Jingwen Zhao* and Guanglei Cui*



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Introducing atomistic dynamics at van der Waals surfaces for enhancing the thermoelectric performance of layered Bi_{0.4}Sb_{1.6}Te₃

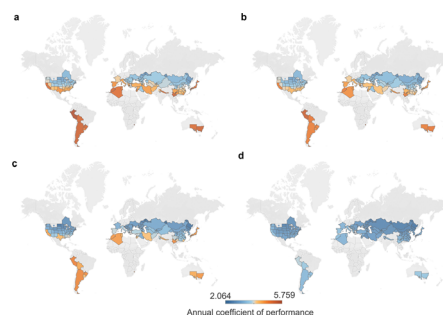
Adil Mansoor, Bushra Jabar, Syed Shoaib Ahmad Shah, Muhammad Sufyan Javed, Tayyaba Najam, Muhammad Ishaq, Shuo Chen, Fu Li, Xiao-Lei Shi, Yue-Xing Chen, Guang-Xing Liang, Zhi-Gang Chen and Zhuang-Hao Zheng*



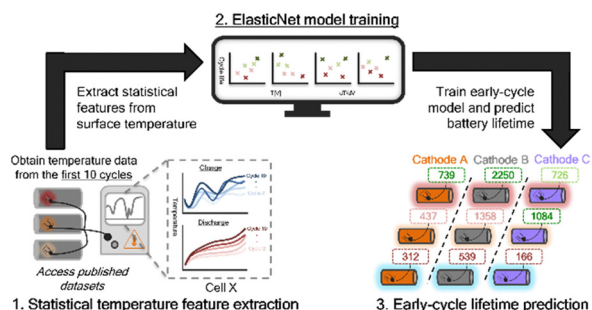
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Fewer temperature ties: scalable integration and broad selection of phase change materials for both heating and cooling

Xiaoxue Kou, Jiatong Jiang, Baoshan Xie, He Shan, Primož Poredoš and Ruzhu Wang*



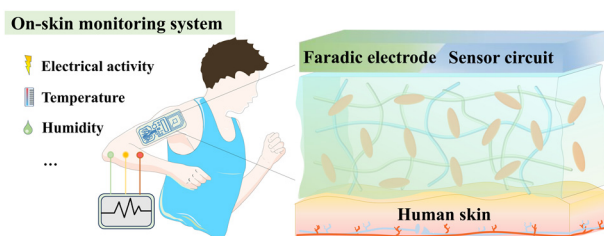
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Battery lifetime prediction using surface temperature features from early cycle data

Lawnardo Sugiarto, Zijie Huang and Yi-Chun Lu*

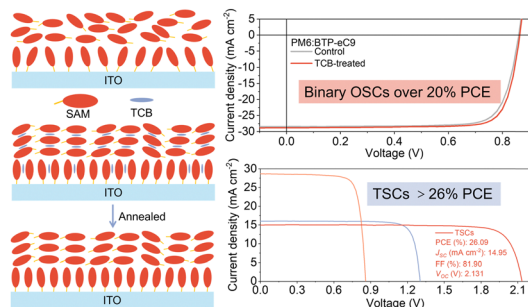
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Biomimetic bone hydrogel enables a seamless interface for aqueous battery and human/machine interaction

Lingbo Yao, Yichao Wang, Lvzhang Jiang, Gege Wang, Xiaowei Chi* and Yu Liu*

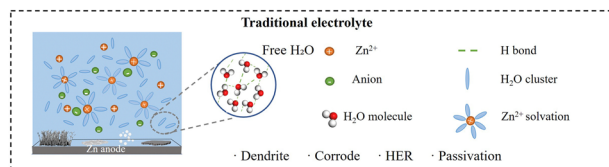
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From 20% single-junction organic photovoltaics to 26% perovskite/organic tandem solar cells: self-assembled hole transport molecules matter

Xiaokang Sun, Fei Wang, Guo Yang, Xiaoman Ding, Jie Lv, Yonggui Sun, Taomiao Wang, Chuanlin Gao, Guangye Zhang, Wenzhu Liu, Xiang Xu, Soumitra Satapathi, Xiaoping Ouyang, Annie Ng, Long Ye, Mingjian Yuan, Hongyu Zhang and Hanlin Hu*

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Constructing a gradient soft-coupled SEI film using a dilute ternary electrolyte system towards high-performance zinc-ion batteries with wide temperature stability

Tiantian Wang, Yuao Wang, Peng Cui, Heshun Geng, Yusheng Wu, Fang Hu,* Junhua You* and Kai Zhu*

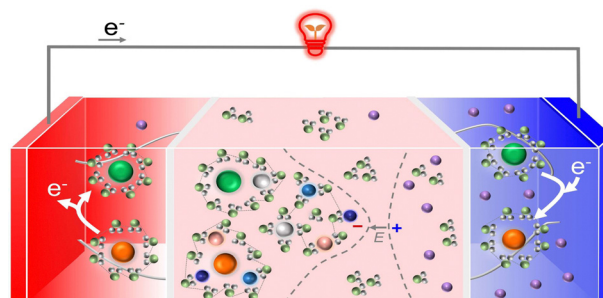


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Remarkable ionic thermoelectric performance of high-entropy gel thermocell near room temperature

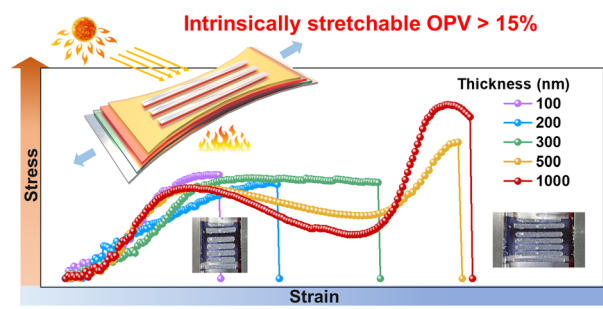
Lijuan Yang, Jiawei Chen, Cheng-Gong Han,*
Yongbin Zhu, Chunxia Xie, Zhenbang Liu, Haoyu Wang,
Yu Bao, Dongxue Han* and Li Niu*



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Simultaneously improving efficiency, stability and intrinsic stretchability of organic photovoltaic films via molecular toughening

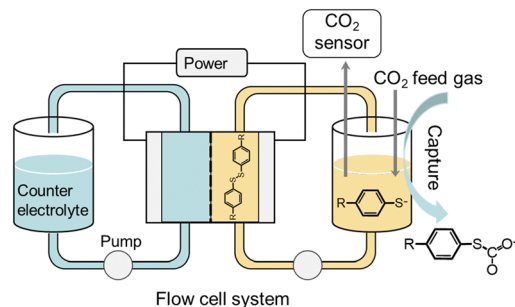
Kaihu Xian, Kai Zhang, Tao Zhang, Kangkang Zhou,
Zhiguo Zhang, Jianhui Hou, Haoli Zhang, Yanhou Geng
and Long Ye*



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Exploiting thiolate/disulfide redox couples toward large-scale electrochemical carbon dioxide capture and release

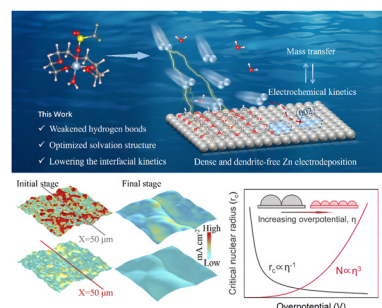
Xiaoxin Li, Chao Deng, Rong Chen, Xu Li, Furong Xie,
Zinan Wu, Yu Xie, Song Wang and Guo-Ming Weng*



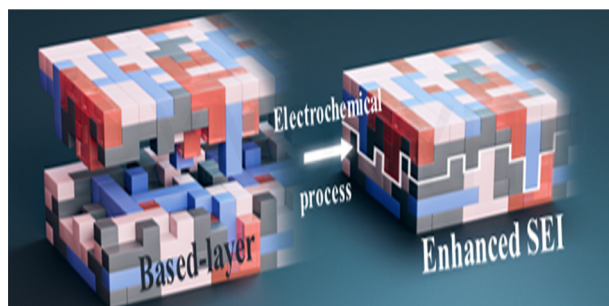
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Regulating interfacial kinetics boosts the durable A h-level zinc-ion batteries

Shenglong Li, Yunpeng Zhong, Jiangtao Huang,
Guojun Lai, Le Li, Long Jiang,* Xieyu Xu, Bingan Lu,
Yangyang Liu and Jiang Zhou*



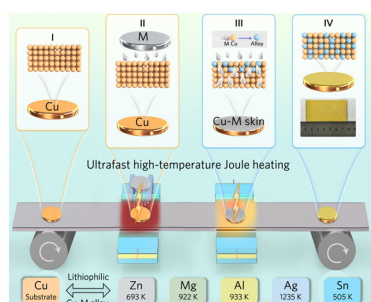
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Pre-constructing a mortice-tenon joint based-layer to achieve an enhanced SEI on Li metal anode

Kun Wang, Chutao Wang, Sheng Liu, Congcong Du, Qingyi Zheng, Jiaqing Cui, Xinxin Yang, Yuxin Tang, Ruming Yuan, Mingsen Zheng, Jingmin Fan* and Quanfeng Dong*

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Scalable copper current collectors with precisely engineered lithiophilic alloy "skins" for durable lithium-metal batteries

Huiqun Wang, Yuxiang Mao, Peng Xu, Yu Ding, Huiping Yang, Jian-Feng Li, Yu Gu,* Jiajia Han,* Li Zhang* and Bing-Wei Mao

