

Energy & Environmental Science

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See Mingxian Liu *et al.*, pp. 6540–6547. Image reproduced by permission of Mingxian Liu from *Energy Environ. Sci.*, 2025, **18**, 6540.



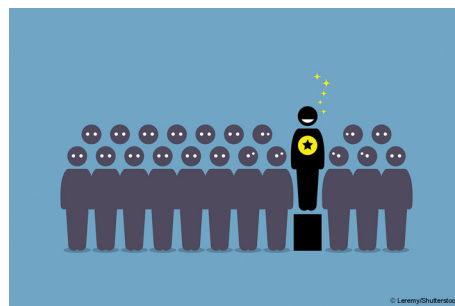
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See Daobin Yang, Yan Huang, Ziyi Ge *et al.*, pp. 6548–6556. Image reproduced by permission of Daobin Yang from *Energy Environ. Sci.*, 2025, **18**, 6548.

EDITORIAL

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Outstanding Reviewers for *Energy & Environmental Science* in 2024

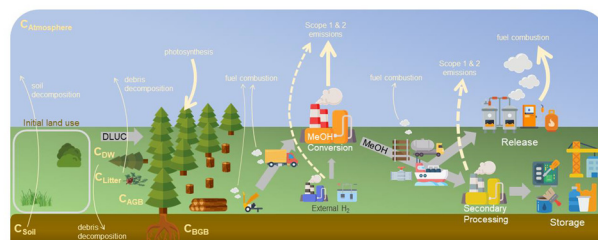


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CO₂e emissions of renewable methanol from forestry residues and conventional natural gas-based methanol: a comparative analysis

Miriam Blaine,* Paul Webley and Damon Honnery



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Fundamental questions
Elemental answers

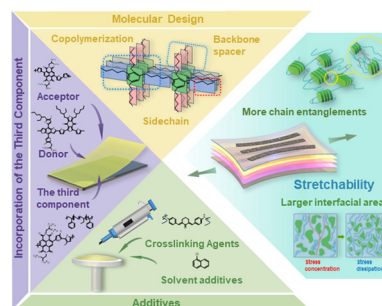


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Stretching the future: strategies and emerging trends in stretchable organic photovoltaic materials

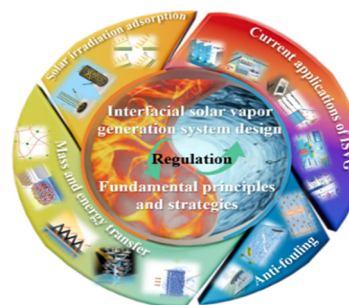
Jingyu Zuo, Dexia Han, Huifeng Yao,
Vakhobjon Kuvondikov and Long Ye*



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The route for applied interfacial solar vapor generation: fundamental principles, device design, and practical application

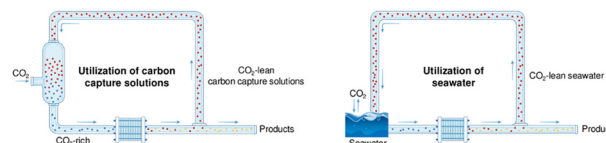
Bowen Liu, Yawei Yang,* Qi Zhao, Yihong Liu,
Yuyao Shen, Yong Ma and Wenxiu Que*



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Electrochemical reactors for the utilization of liquid-phase carbon species

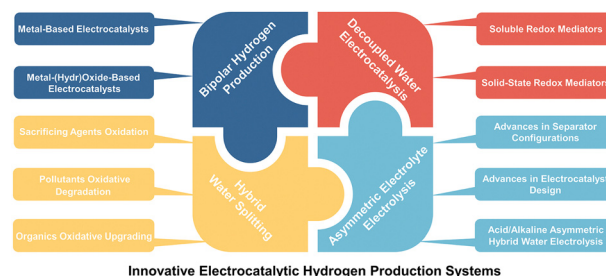
Jundong Wang, Pan Zhu, Hongling Qin, Kuichang Zuo,
Huazhang Zhao* and Zishuai Bill Zhang*



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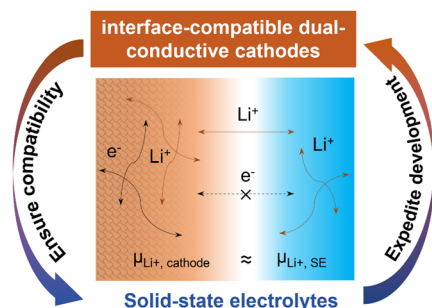
Recent advances in innovative systems for electrocatalytic hydrogen production

Liangshuang Fei, Hainan Sun,* Yu Li, Yuxing Gu,
Wei Zhou* and Zongping Shao*



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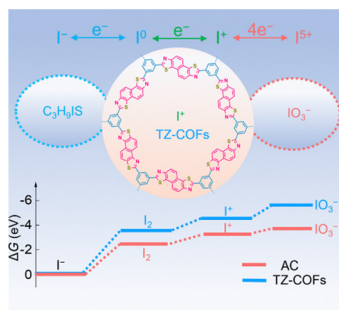


Solid-state electrolytes expediting interface-compatible dual-conductive cathodes for all-solid-state batteries

Shumin Zhang, Feipeng Zhao, Liang Li* and Xueliang Sun*

PAPERS

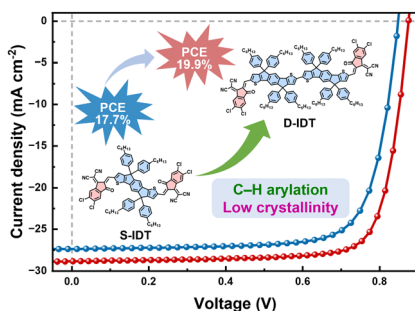
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High-conversion-efficiency and stable six-electron Zn-I₂ batteries enabled by organic iodide/thiazole-linked covalent organic frameworks

Wenyan Du, Qi Huang, Xunwen Zheng, Yaokang Lv, Ling Miao, Ziyang Song, Lihua Gan and Mingxian Liu*

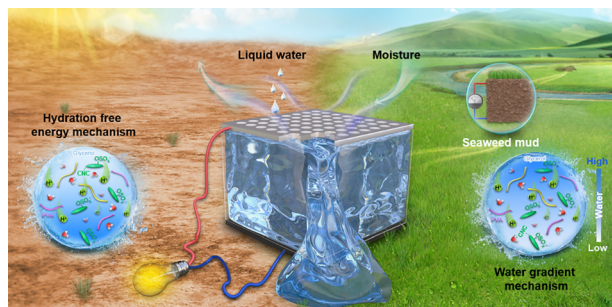
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Direct C–H arylation-derived low crystallinity guest acceptor for high efficiency organic solar cells

Pengfei Ding, Xugang Rong, Daobin Yang,* Xueliang Yu, Zhenxin Shao, Hongqian Wang, Xiaochun Liao, Xinyue Cao, Jie Wu, Lin Xie, Jintao Zhu, Fei Chen, Guo Chen, Yan Huang* and Ziyi Ge*

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Harnessing dual forms of water energy for all-weather high-performance electricity generation using amorphous slurry

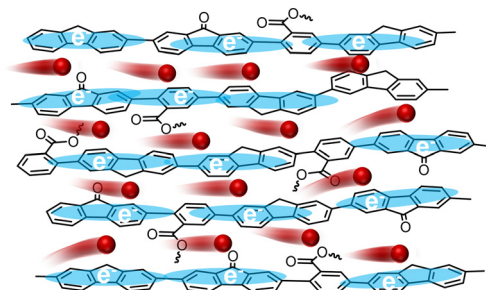
Wenna Ge, Quanmao Wei, Wenzong Li, Xu Wang, Chenguang Lu, Keke Zhang, Xuanqi Luo, Lemin Zhang, Yu Sun* and Yahua Liu*



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Ballistic ion transport through hierarchically-ordered-structure polymer binder

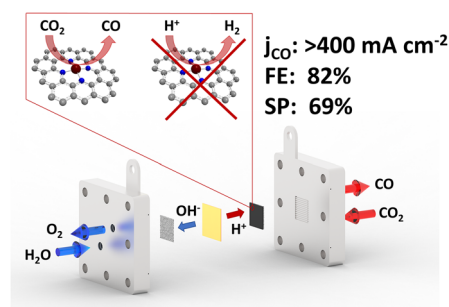
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Failure mode diagnosis and stabilization of an efficient reverse-bias bipolar membrane CO₂ to CO electrolyzer

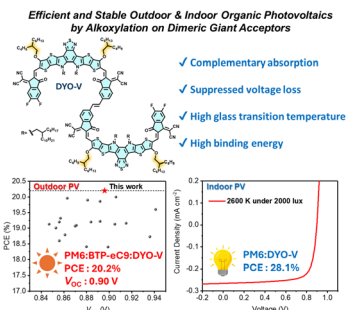
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Improved efficiency and stability of outdoor and indoor organic photovoltaics with suppressed voltage loss via alkoxylation on dimeric giant acceptors featured as supramolecular stabilizers

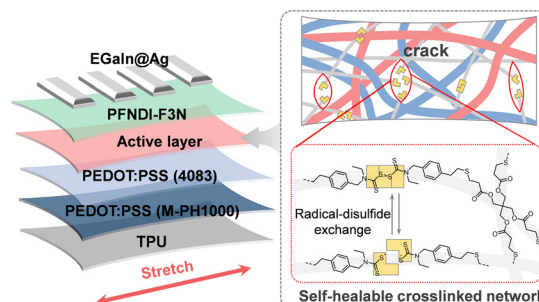
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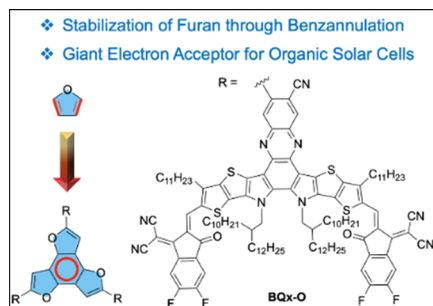
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Dynamic disulfide bond networks enable self-healable and mechanically resilient intrinsically stretchable organic solar cells

Wenyu Yang, Xuanang Luo, Jiankang Liu, Jingchuan Chen, Xuefei Wu, Zachary Fink, Chuqi Shi, Wenkai Zhong,* Cheng Wang and Lei Ying*



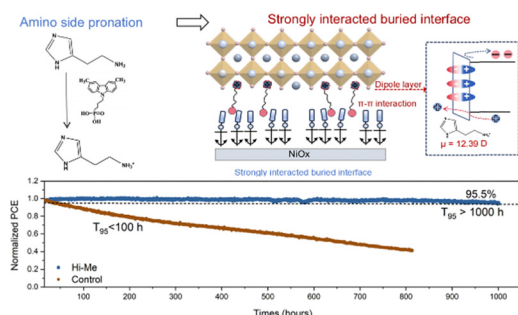
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Benzannulation of furan: a strategy for stable and high-performance furan-containing giant electron acceptor with efficiency exceeding 20%

Li Chen, Wenting Liang, Aleksandr Sergeev, Joshua Yuk Lin Lai, Xianghao Zeng, Kam Sing Wong, Jianquan Zhang,* Sai Ho Pun,* He Yan* and Huawei Hu*

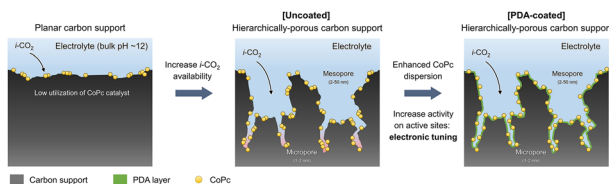
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Design of strong and weak intermolecular interactions to engineer buried interfaces in inverted wide-bandgap perovskite solar cells

Hui Li,* Davide Regaldo, Chun-Sheng Jack Wu, Mirko Prato, Antonella Treglia, Heyong Wang, Wolfram Hempel, Michele Sessolo, Yang Zhou, Andrea Olivati and Annamaria Petrozza*

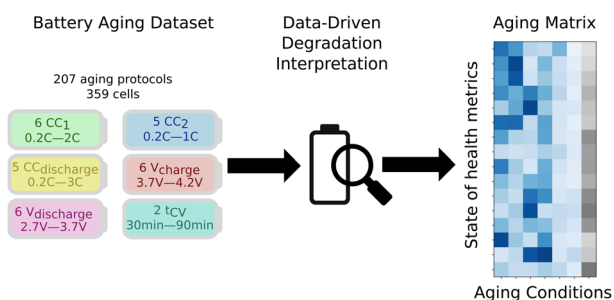
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Hierarchically porous carbon supports enable efficient syngas production in electrified reactive capture

H. Liu, H. Shin, X.-Y. Li, G. Su, P. Ou, Y. Wang, L. Chen, J. Yu, Y. Chen, R. Xia, G. Lee, K.-S. Lee, C. Yu, P. Wang, D. Choi, D. Zhou, C. Tian, I. Gereige, A. Alahmed, A. Jamal, O. K. Farha, Shannon W. Boettcher, Jennifer B. Dunn, Ke Xie* and Edward H. Sargent*

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Aging matrix visualizes complexity of battery aging across hundreds of cycling protocols

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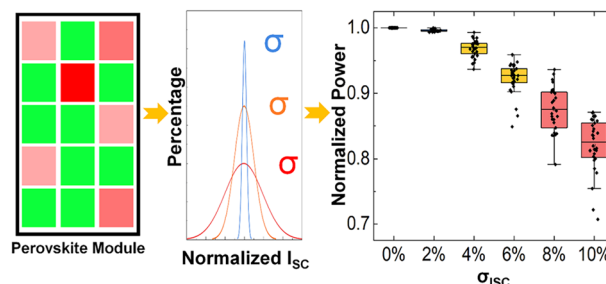


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The impact of current mismatch among individual cells on the performance of perovskite photovoltaic modules

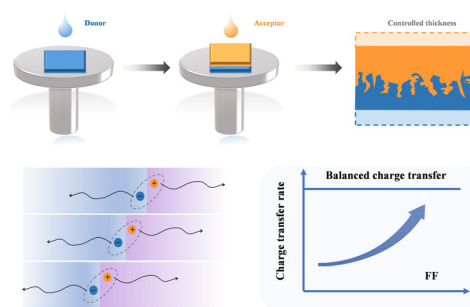
Chungil Kim, Jiwon Song, Subin Lee, Chanwoo Kim, Jeongin Seo, Hangil Lee, Jaehwan Ko, Junseop Byeon* and Hyung-Jun Song*



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Balanced electron and hole transfer behavior enabled approaching 19% efficiency in thick-film organic solar cells with improved fill factor

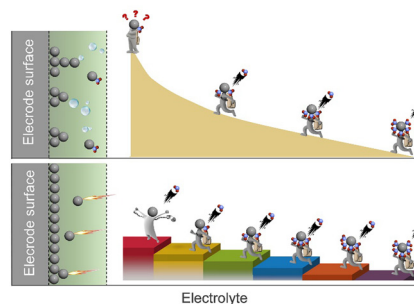
Zhongwei Ge, Jiawei Qiao, Xiaoming Li, Runzheng Gu, Wenqing Zhang, Bohao Song, Guanghao Lu, Wei Ma, Xiaotao Hao* and Yanming Sun*



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Graded desolvation accelerators based on high-entropy alloys with widely distributed d-band centers for high-performance aqueous zinc-ion batteries

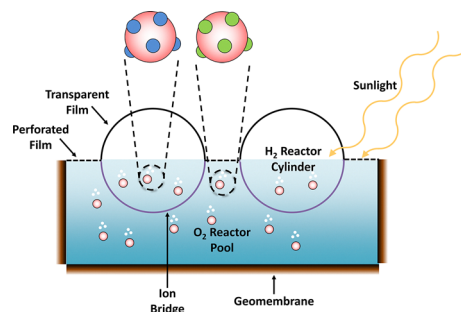
Yanxin Li, Hongfeng Jia, Lihua Fu, Usman Ali, Liang Zhao, Lingyu Zhang, Lu Li*, Yuebo Yang, Chungang Wang and Bingqiu Liu*



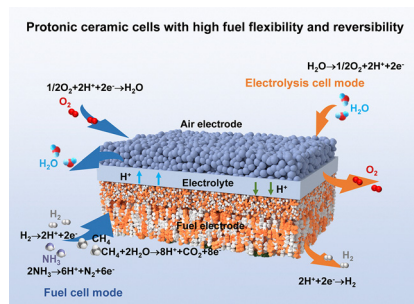
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Levelized cost and carbon intensity of solar hydrogen production via water splitting using a scalable and intrinsically safe photocatalytic Z-scheme raceway system

Stephanie Collins, Yaset Acevedo, Daniel V. Esposito, Rohini Bala Chandran, Shane Ardo, Brian D. James* and Hanna Breunig*



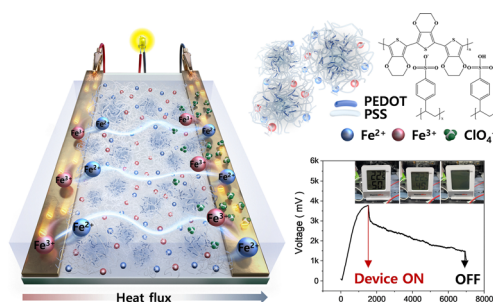
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Tailoring the structural durability and proton conductivity of electrolytes for highly fuel-flexible and reversible ceramic cells

Fan He, Yixuan Huang, Kang Xu, Yangsen Xu, Feng Zhu, Shihang Guo, Donglin Han, Haoliang Tao, Liangzhu Zhu, Kotaro Sasaki, YongMan Choi,* Zongping Shao* and Yu Chen*

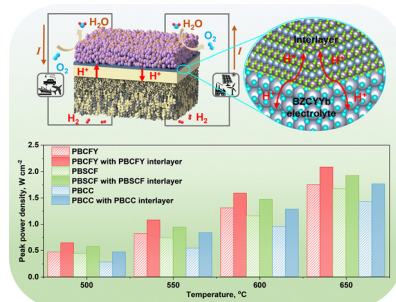
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Solid-state n-type thermodiffusion-assisted thermogalvanic cells with unprecedented thermal energy conversion

Jeong-Ye Baek, Hae Jin Seog and Sung-Yeon Jang*

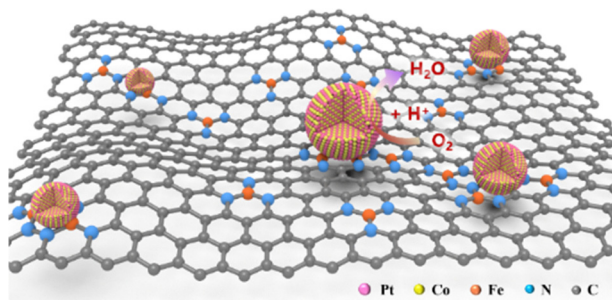
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A universal interfacial-engineering strategy for the air electrodes of reversible protonic ceramic electrochemical cells

Kang Xu, Yangsen Xu, Feng Zhu, Zhiwei Du, Xirui Zhang, Zhuo Cheng and Yu Chen*

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Neighboring iron single atomic sites boost PtCo intermetallic activity for high-durability ORR electrocatalysis

Kai Chen, Junheng Huang, Junxiang Chen, Jiyuan Gao, Zhiwen Lu, Xi Liu, Senchen Lan, Guohua Jia,* Suqin Ci* and Zhenhai Wen*

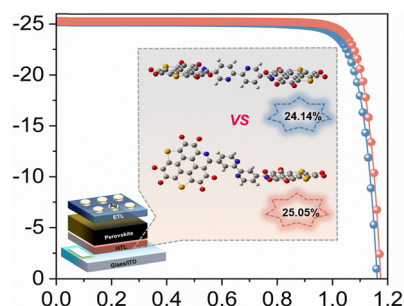


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Isomeric selenasumanene-pyridine-based hole-transporting materials for inverted perovskite solar cells

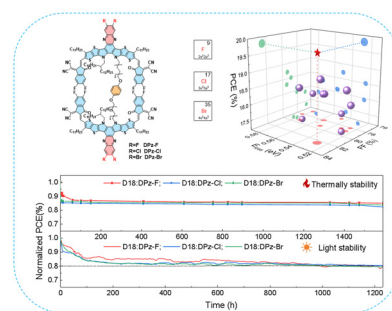
Muhammad Azam, Yao Ma, Boxue Zhang, Zhongquan Wan,* Xiangfeng Shao,* Haseeb Ashraf Malik, Xian Yang, Junsheng Luo* and Chunyang Jia*



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Halogen-substituted phenazine cores reduce energy losses and optimize carrier dynamics in tethered acceptors for 19.8% efficient and stable polymer solar cells

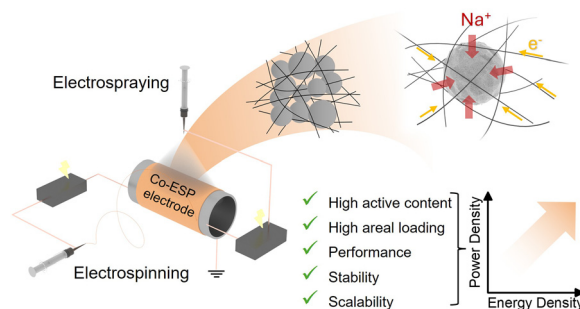
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High-areal-capacity Na-ion battery electrode with high energy and power densities by simultaneous electrospinning-spraying fabrication

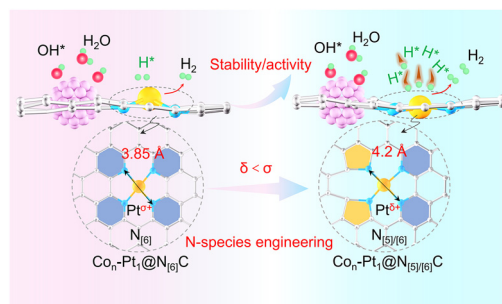
Mengzheng Ouyang,* Zhenyu Guo, Luis E Salinas-Farran, Yan Zhao, Siyu Zhao, Kaitian Zheng, Hao Zhang, Mengnan Wang, Guangdong Li, Feiran Li, Xinhua Liu, Shichun Yang, Fei Xie, Paul R. Shearing, Maria-Magdalena Titirici and Nigel P. Brandon



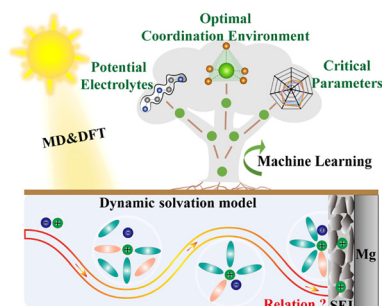
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Precision N-species engineering in Pt–N₄ via ring reconstruction towards efficient alkaline water electrolysis

Zhenyu Liu, Junyi Du, Jin Yang, Yuanyuan Yan, Yatong Wang, Meiling Wang,* Tian Wang,* Lixing Kang* and Dingsheng Wang



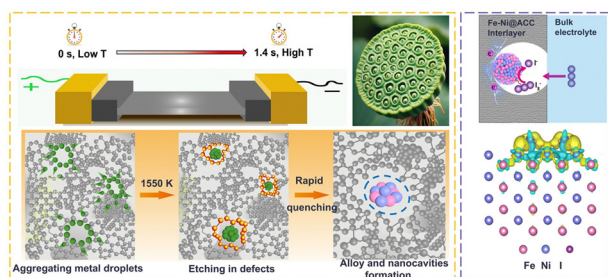
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Data-driven design of advanced magnesium-battery electrolyte *via* dynamic solvation models

Ruimin Li, Wanyu Zhao,* Zhengqing Fan, Meng Zhang, Jiayi Li, Rushuai Li, Zhijun Zuo* and Xiaowei Yang*

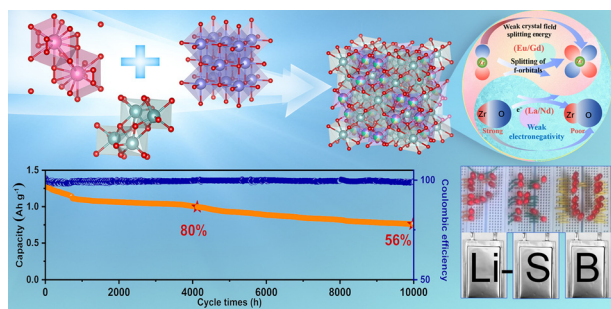
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Lotus seedpod-inspired electrocatalytic interlayers synthesized *via* ultrafast Joule heat treatment: overcoming polyiodide shuttle and enhancing redox kinetics in high-areal-capacity aqueous zinc–iodine batteries

Rong Tang, Chenxi Sun, Jin Yang, Siyang Li, Weiwei Meng, Minghao Zhang, Guanhong Chen, Jinbao Zhao* and Yang Yang*

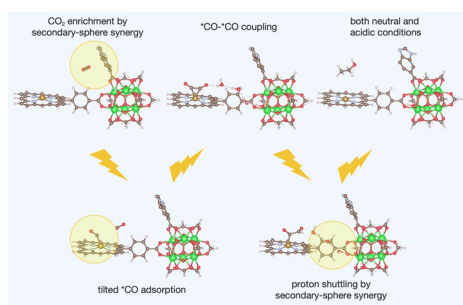
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Unconventional catalytic kinetics of dual field regulated pyrochlore-type high-entropy ceramics towards the Li_2S_4 intermediate

Lin Zhou, Handing Liu,* Ji-Xuan Liu, Xinrui Zhang, Yixi Yao, Ruirui Wang, Ziliang Chen,* Prashanth W. Menezes* and Guo-Jun Zhang*

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A bioinspired electrocatalyst for CO_2 electroreduction to ethanol *via* secondary-sphere synergy in Fe porphyrinic-based metal–organic frameworks

Kaian Sun, Shaohui Xie, Ping Guan, Zewen Zhuang, Xin Tan, Wei Yan,* Jiujun Zhang* and Chen Chen*



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Ionic potential modulation within and between layers of transition metal oxides towards ultrahigh-rate sodium storage

Ziming Wang, Riming Hu, Hao Chen, Yuxuan Ye, Qi Zhao, Zhiguo Du* and Shubin Yang*

