

Energy & Environmental Science

rsc.li/ees

The Royal Society of Chemistry is the world's leading chemistry community. Through our high impact journals and publications we connect the world with the chemical sciences and invest the profits back into the chemistry community.

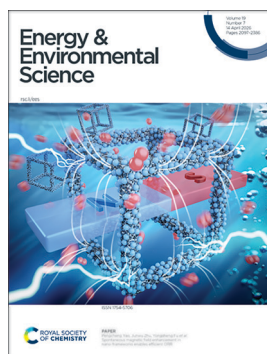
IN THIS ISSUE

ISSN 1754-5706 CODEN EESNBY 19(7) 2097-2386 (2026)



Cover

See Tae Gwang Yun, Han Seul Kim, Ji-Soo Jang *et al.*, pp. 2149–2160. Image reproduced by permission of Ji-Soo Jang from *Energy Environ. Sci.*, 2026, **19**, 2149.



Inside cover

See Pengcheng Yao, Junwu Zhu, Yongsheng Fu *et al.*, pp. 2161–2171. Image reproduced by permission of Yongsheng Fu from *Energy Environ. Sci.*, 2026, **19**, 2161.

OPINION

2106

Workforce readiness: the missing lever for scaling climate technologies

Olga Belyanina, Sebastian Startz, H el ene Pilorg e, Makenna Damhorst, Lorena S. Grundy, Nicolaj Siggelkow and Jennifer Wilcox*

Illustrative Workforce Pressure Points

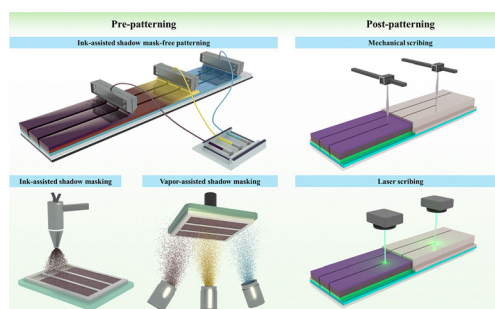
| | Advanced Nuclear | Biomanufacturing | Next-Generation Geothermal | Electrochemical Batteries |
|------------------------------|-------------------------------------|--|--|-----------------------------------|
| Engineering & R&D | Low | Low | Low | Low |
| Regulatory | High | Low | Low | Low |
| Sales & Commercial | Low | High | Low | High |
| Project Development | High | High | Low | High |
| Skilled Trades | High | Low | High | Low |
| Technicians / Operators | Low | High | High | Low |
| Overall Workforce Constraint | High | High | Medium | Low |
| Adjacent Talent Pools | Coal, other steam-to-electric power | Food processing, pharma, process manufacturing | Oil and gas, electric power plants, wind | Steel, roll-to-roll manufacturing |

REVIEW

2112

Review of module designs for organic and perovskite solar cells

Jae Won Kim, You-Hyun Seo, Hee Jeong Jeong, Eun Chong Chae, Helen Hejin Park, Bong Joo Kang, Kyungsik Kim, Jinho Lee,* Soonil Hong* and Nam Joong Jeon*



**GOLD
OPEN
ACCESS**

EES Batteries

**Exceptional research on
batteries and energy storage**

Part of the EES family

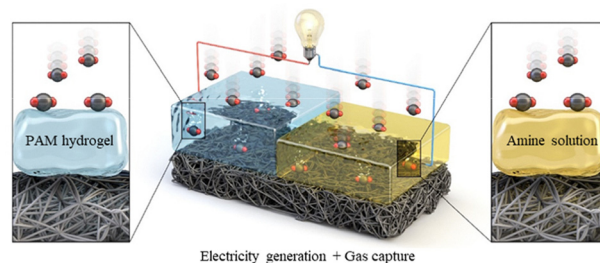


**Join
in** | Publish with us
rsc.li/EESBatteries

2149

Electrical power generation from asymmetric greenhouse gas capture

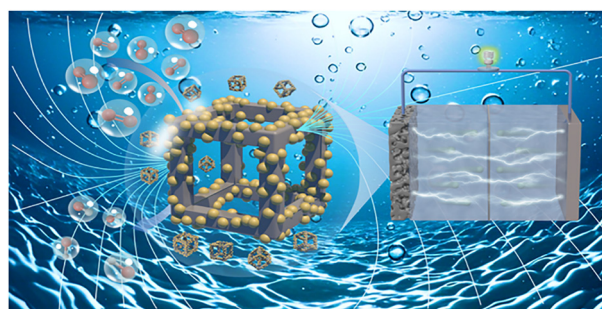
Tae Gwang Yun,* Yejin Lee, Joonchul Shin, Dong Ho Lee, Min Taek Hong, Seonghun Lee, Sang-Joon Kim, Hyun Ji Lee, Jiwon Lee, Gyeongrok Min, Seunghyun Weon, Minho Choi, Ho Won Jang, Han Seul Kim* and Ji-Soo Jang*



2161

Spontaneous magnetic field enhancement in nano-frameworks enables efficient ORR

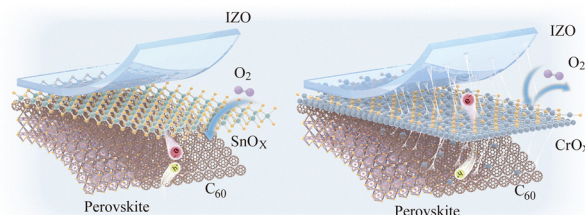
Zhijie Qi, Zhenjie Lu, Pengcheng Yao,* Wuxin Ba, Lianjin Wei, Duansheng Liu, Jun Jiang, Shujun Liu, Pawel J. Kulesza, Jingwen Sun, Pan Xiong, Xin Wang, Junwu Zhu* and Yongsheng Fu*



2172

Cr–O–In interlocking for window layer delamination resistance in operationally stable perovskite/silicon tandem solar cells

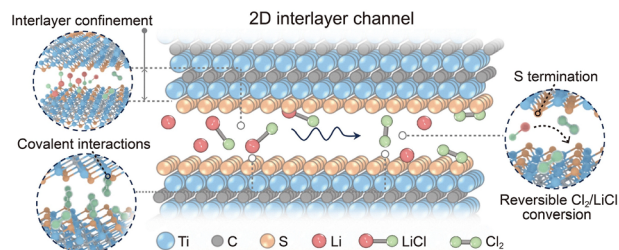
Huan Li, Zhiqin Ying,* Wenfeng Liu, Xin Li, Fanshu Kong, Ziyu He, Haofan Ma, Yunyun Yu, Rui Li, Meili Zhang, Yan Zheng, Xuefeng Hu, Yuheng Zeng, Luyao Zheng, Xi Yang* and Jichun Ye*



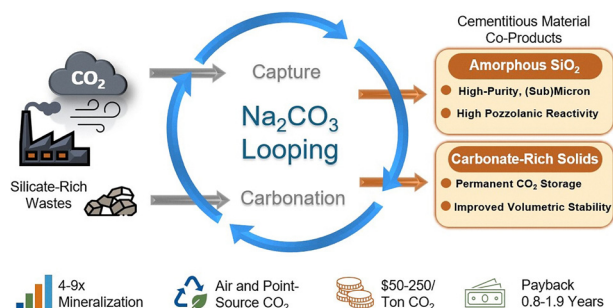
2184

Interlayer chemical confinement enables highly reversible and durable lithium–chlorine batteries

Baoquan Liu, Yanzeng Ge, Changfeng Lin, Haizhen Jiang, Tianyu Qiu, Jing Li, Hui Zhang, Jinlin Yang* and Xinlong Tian*



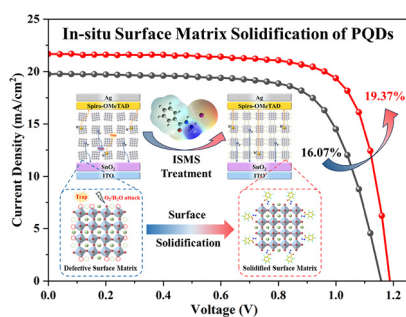
2194



Looping-accelerated CO_2 mineralization for cost-competitive cementitious materials and hydrogen

Kyle Shank, Hefei Xu, Yunming Xu, Amirmohammad Arjomand Kermani, Jiangzhou Qin and Shang Zhai*

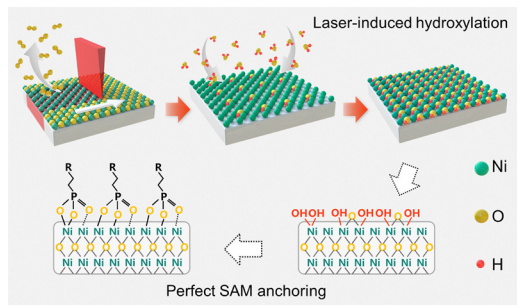
2213



In situ surface matrix solidification of FAPbI_3 perovskite quantum dots for solar cells with 19.37% efficiency

Sicong Huang, Mingxu Zhang, Guoliang Wang, Zehong Yuan, Zhimei Sun* and Xiaoliang Zhang*

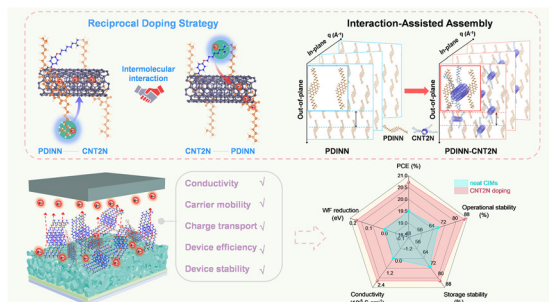
2226



Laser-induced surface hydroxylation of nickel oxide boosting monolayer assembly for high-performance perovskite solar modules

Zheng Lv, Guozhen Liu,* Zhiyong Wang, Yilin Gao, Muge Xu, Lin Yang, Ziyang Tian, Yinjuan Zhang, Guanghao Zhou, Bo Xu, Zicheng Liu, Guohao Dai, Wei Lu, Pengfei Wang, Jiazhen Wei, Qingshun Dong, Jiming Bian and Yantao Shi*

2237



Dual-molecule reciprocal doping strategy for cathode interfacial materials enables over 20.7% efficiency in organic solar cells

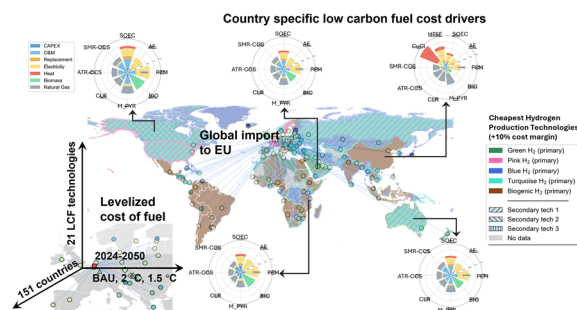
Chengcheng Xie, Yuanpeng Xie,* Longjun Fu, Xiaxia Yang, Nian Zhang, Bo Xu, Zhuo Wang, Dianyong Tang, Liming Ding, Feng Liu* and Menglan Lv*



2246

Global cost drivers and regional trade-offs for low-carbon fuels: a prospective techno-economic assessment

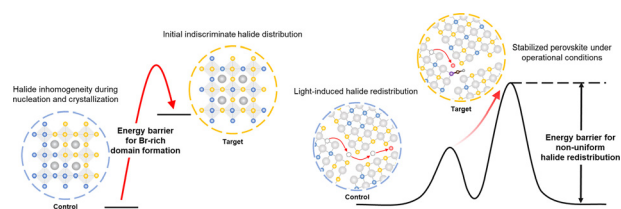
Zipeng Liu,* Tom Terlouw, Patrick Frey, Christian Bauer* and Russell McKenna



2273

Thermodynamic inhibition of bromine-rich phase nucleation in wide-bandgap perovskites for operationally stable tandem solar cells

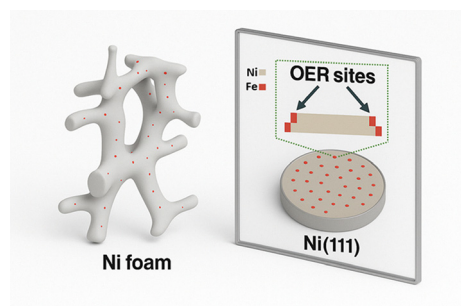
Xueying Yang, Zhongliang Yan, Shibo Wang, Pengfei Fu, Chunyan Deng, Guang Yang,* Yu Lou, Zhaojin Wang, Miao Zeng, You Chen, Zhicong Zhou, Xinyu Ye, Xiaokang Sun, Chengwei Shan, Yuanmiao Sun, Aung Ko Ko Kyaw, Hanlin Hu, Zhifang Shi, Zaiwei Wang, Xinbo Yang,* Xiaohong Zhang,* Gang Li, Yang Bai* and Hui-Ming Cheng*



2289

Precatalytic surface roughness of Fe-modified Ni electrodes translates into intrinsic sites for oxygen evolution reactivity

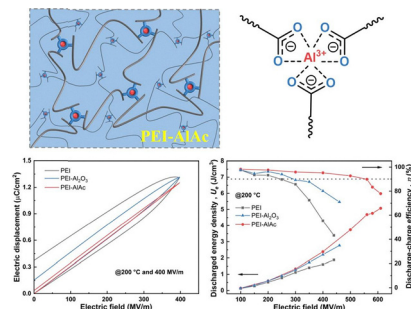
Ramadan Chalil Oglou, Morten Linding Frederiksen, Paul Maurice Leidinger, Marcel Ceccato, Anders Bentien and Jeppe V. Lauritsen*



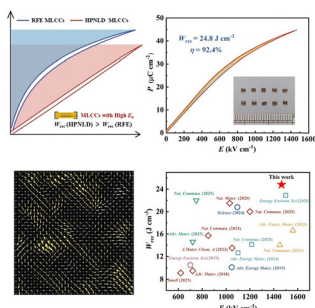
2300

Superior high-temperature electrostatic energy storage in flexible dielectric films enabled by metal-coordination crosslinked networks

Minhao Yang,* Shiang Zhao, Yanlong Zhao, Haoran Sun, Huarui Yan, Chong Zhang, Jiajun Qu, Jun Liu,* Bobo Tian* and Zhi-Min Dang*



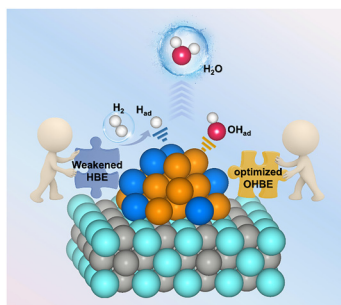
2311



Ultrahigh energy storage in multilayer capacitors with self-assembled glass-like matrix and polar clusters

Zhen Liu,* Minghao Liu, Tengfei Hu, Xiang Niu, Bin Zhou, Teng Lu,* Cheng Yang, Fei Cao, Shengguo Lu,* Yun Liu, Genshui Wang* and Junhao Chu

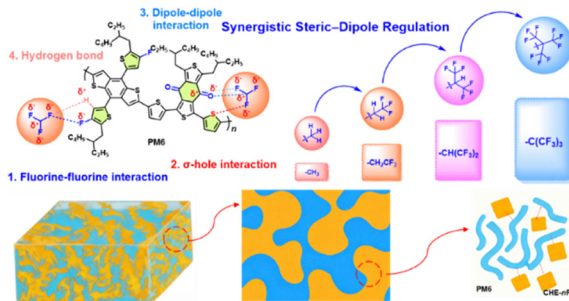
2321



Ultrasmall MoC-supported PtRu clusters with boosted HOR activity and CO tolerance via metal–support interaction

Yaheng Gu, Shaoqing Zhang, Zihao Li, Dezheng Zhang, Jianzhi Liu, Mingda Zhao, Ce Han, Xiue Jiang,* Ping Song* and Weilin Xu*

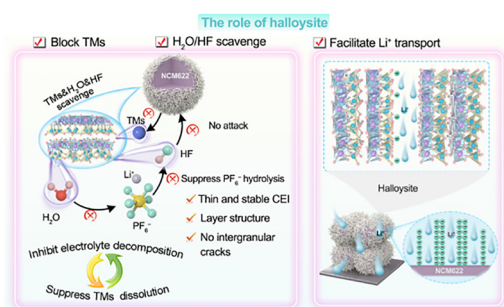
2333



Synergistic steric–dipole modulation via stepwise trifluoromethyl substitution enables active-layer hierarchical assembly and >20% power conversion efficiency in organic photovoltaic devices

Jie Wang, Xin Chen, Jingyi Huo, Jiong Yang, Longyu Li, Wendi Shi, Ruibin Bian, Wenkai Zhao, Guankui Long, Zhaoyang Yao, Chenxi Li, Xiangjian Wan* and Yongsheng Chen*

2345



A multifunctional natural clay mineral additive for stabilizing Ni-rich layered oxide cathodes

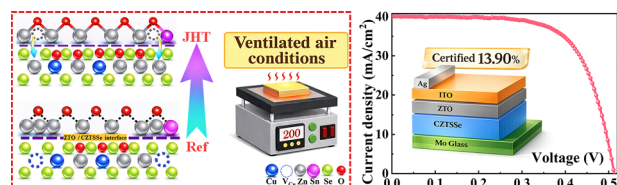
Liu Yang, Zeyi Wang, Lu Chen, Yanxin Jiang, Hongji Pan,* Chunlei Song, Tianshuai Wang,* Anjun Hu, Jianping Long,* Yiju Li* and Tianshou Zhao



2356

Intrinsic defect compensation in the space charge region enables cadmium-free kesterite solar cells to achieve 13.9% certified efficiency

Yonggang Zhao, Shuo Chen,* Jiangjian Shi,*
Shurong Wang, Jia Yang, Zhenghua Su,
Zhuanghao Zheng, Hongli Ma, Xianghua Zhang and
Guangxing Liang*



2367

Microstructure of electrodeposited lithium and its evolution during cycling when using metal interlayers in “anode-free” solid-state batteries

Juri Becker, Luca Schuster, Sascha Kremer, Till Fuchs*
and Jürgen Janek*

