

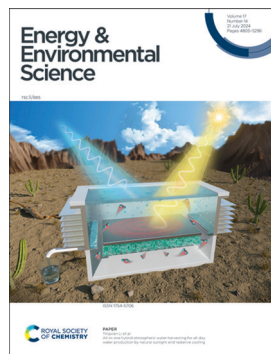
Energy & Environmental Science

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.

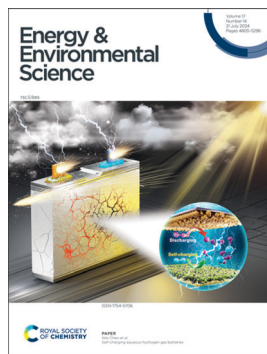
IN THIS ISSUE

ISSN 1754–5706 CODEN EESNBY 17(14) 4805–5296 (2024)



Cover

See Tingxian Li *et al.*, pp. 4988–5001.
Image reproduced by permission of Tingxian Li from *Energy Environ. Sci.*, 2024, 17, 4988.



Inside cover

See Wei Chen *et al.*, pp. 5013–5023.
Image reproduced by permission of Wei Chen from *Energy Environ. Sci.*, 2024, 17, 5013.

EDITORIAL

4818

Improving transparency in peer review at *Energy & Environmental Science*

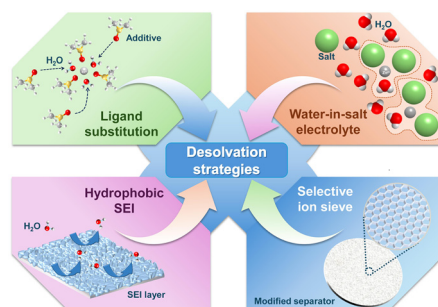


REVIEWS

4819

Tailoring desolvation strategies for aqueous zinc-ion batteries

Wenhao Ma, Sunyufei Wang, Xianwen Wu, Wenwen Liu, Fan Yang, Shude Liu,* Seong Chan Jun, Lei Dai, Zhangxing He* and Qiaobao Zhang*



EES Catalysis

GOLD
OPEN
ACCESS

Exceptional research on energy
and environmental catalysis

Open to everyone. Impactful for all

rsc.li/EESCatalysis

Fundamental questions
Elemental answers

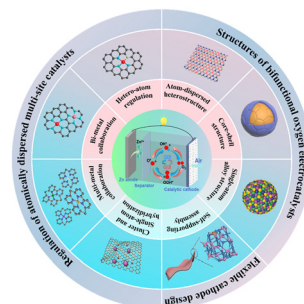


REVIEWS

4847

Atomically dispersed multi-site catalysts: bifunctional oxygen electrocatalysts boost flexible zinc–air battery performance

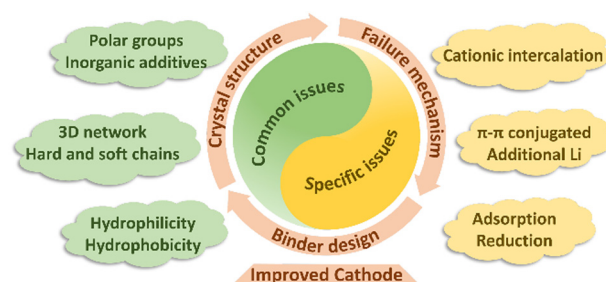
Shengchen Wang, Mengyang Zhang, Xueqin Mu, Suli Liu,* Dingsheng Wang* and Zhihui Dai*



4871

Binder design strategies for cathode materials in advanced secondary batteries

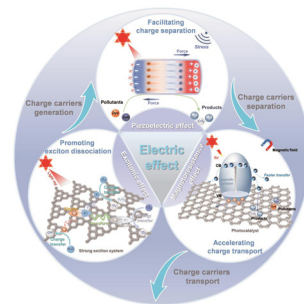
Mengge Lv, Ran Zhao,* Zhifan Hu, Jingjing Yang, Xiaomin Han, Yahui Wang, Chuan Wu* and Ying Bai*



4907

Electric effects reinforce charge carrier behaviour for photocatalysis

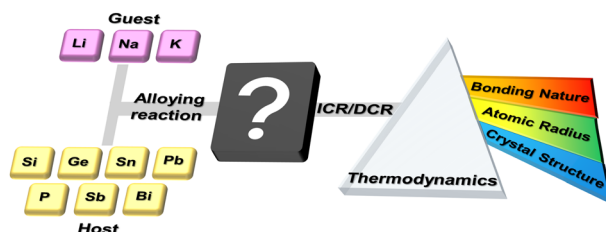
Aoqiang Shu, Chencheng Qin, Miao Li, Luna Zhao, Zichen Shanguan, Zihan Shu, Xingzhong Yuan, Mingshan Zhu, Yan Wu and Hou Wang*



4929

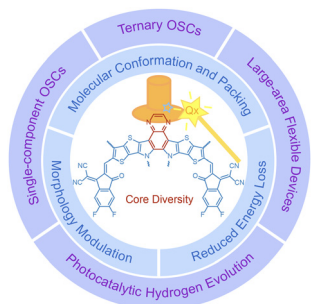
Manipulating non-equilibrium diffusion-controlled reaction toward reversible alloying reactions in alkali ion batteries

Gilseob Kim, Seonyong Cho, Lulu Lyu, Mihui Park, Sanghyun Park and Yong-Mook Kang*



PERSPECTIVE

4944

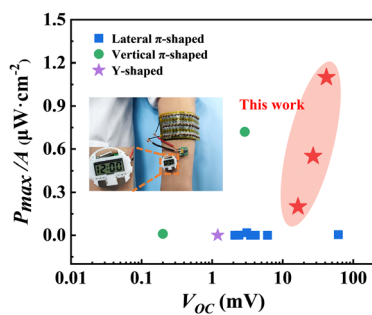


Quinoxaline-based nonfullerene acceptors with powerful core-functionalization ability enabling efficient solar energy utilization

Kerui Liu, Yuanyuan Jiang, Feng Liu* and Xiaozhang Zhu*

COMMUNICATIONS

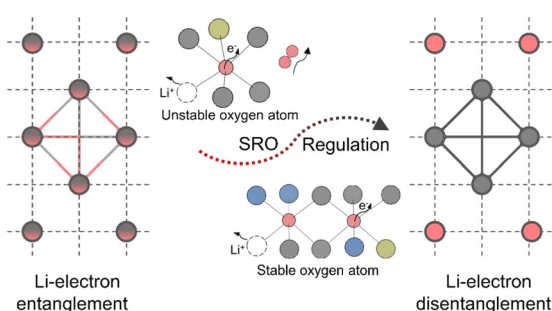
4968



Extraordinary self-powered Y-shaped flexible film thermoelectric device for wearables

Xinjie Yuan, Pengfei Qiu,* Chuanyao Sun, Shiqi Yang, Yi Wu, Lidong Chen and Xun Shi*

4977

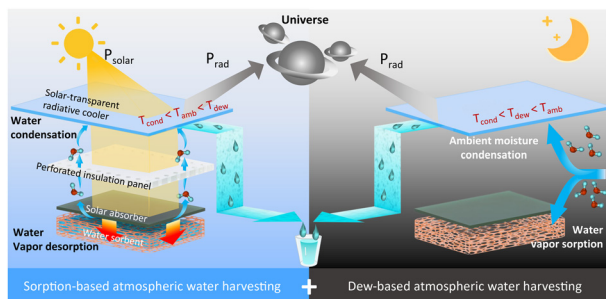


Structural regulation-induced Li-electron disentanglement for stabilized oxygen redox of Li-excess disordered rock-salt cathode materials

Sichen Jiao, Yujian Sun, Dekai Shi, Yuanpeng Zhang, Xuelong Wang,* Jue Liu,* Le Kang, Fangwei Wang, Xiqian Yu,* Hong Li, Liquan Chen and Xuejie Huang

PAPERS

4988



All-in-one hybrid atmospheric water harvesting for all-day water production by natural sunlight and radiative cooling

Jiaxing Xu, Xiangyan Huo, Taisen Yan, Pengfei Wang, Zhaoyuan Bai, Jingwei Chao, Ronggui Yang,* Ruzhu Wang* and Tingxian Li*

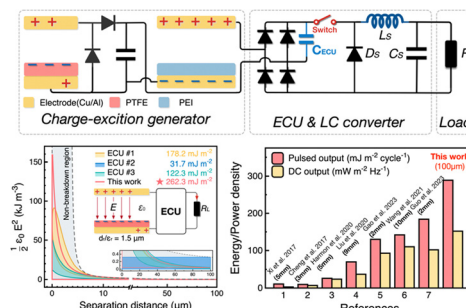


PAPERS

5002

Ultrahigh power generation from low-frequency and micro motion by suppressing air breakdown

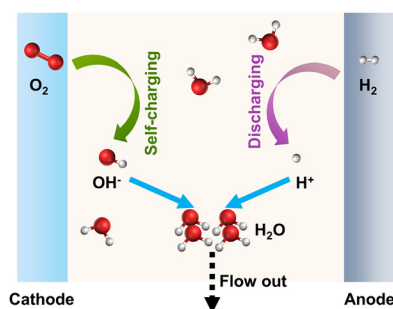
Zeyuan Cao,* Junchi Teng, Rong Ding, Jiani Xu, Chao Ren, Seng-Hong Lee, Xingqi Guo and Xiongying Ye*



5013

Self-charging aqueous hydrogen gas batteries

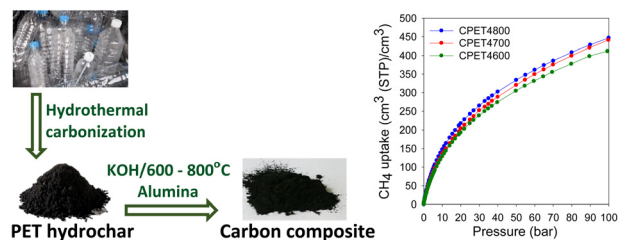
Zhengxin Zhu, Zehui Xie, Weiping Wang, Zaichun Liu, Mingming Wang, Yahan Meng, Qia Peng, Shuang Liu, Taoli Jiang, Kai Zhang, Hongxu Liu, Yirui Ma and Wei Chen*



5024

Porous carbon composites as clean energy materials with extraordinary methane storage capacity

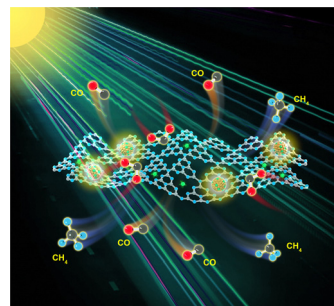
Ibtisam Alali, Amina U. Shehu and Robert Mokaya*



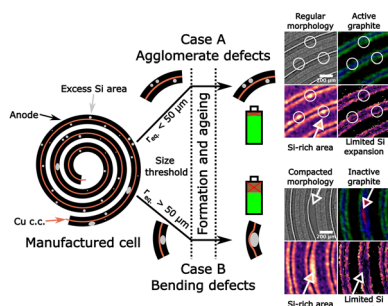
5039

Photocontrolled heterojunctions constructed from holmium single atom modified $\text{Mg}_{1.2}\text{Ti}_{1.8}\text{O}_5/\text{g-C}_3\text{N}_4$ with enhanced photocatalytic CO_2 conversion

Jing An, Shuang Ge, Guofeng Wang* and Honggang Fu*



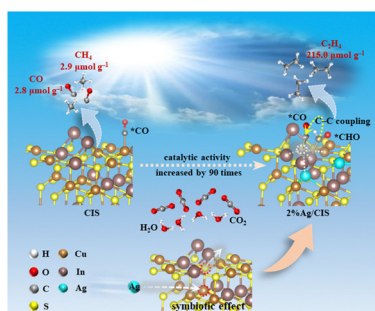
5048



The origins of critical deformations in cylindrical silicon based Li-ion batteries

Erik Lübke, Lukas Helfen,* Phil Cook, Marta Mirolo, Valentin Vinci, Ove Korjus, Bernd Fuchsbichler, Stefan Koller, Roland Brunner, Jakub Drnec* and Sandrine Lyonard*

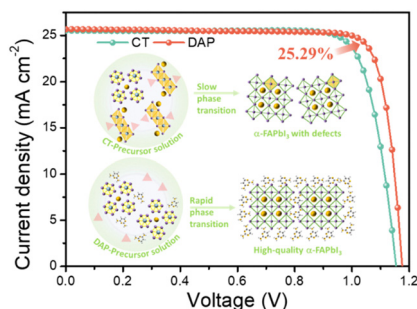
5060



Constructing asymmetric dual active sites through symbiotic effect for achieving efficient and selective photoreduction of CO₂ to C₂H₄

Yong Xu, Ping Wang, Man Zhang, Weili Dai,* Yuxuan Xu, Jian-Ping Zou and Xubiao Luo

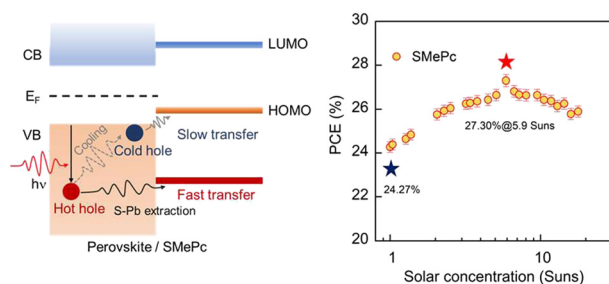
5070



Heterogeneous seed-assisted FAPbI₃ crystallization for efficient inverted perovskite solar cells

Nan Yan, Yang Cao, Zhonghua Dai, Long Jiang, Yuanbo Yang, Tiantian Li, Liwei Li, Shengzhong (Frank) Liu,* Zhimin Fang* and Jiangshan Feng*

5080



A hot carrier perovskite solar cell with efficiency exceeding 27% enabled by ultrafast hot hole transfer with phthalocyanine derivatives

Shaokuan Gong, Geping Qu, Ying Qiao, Yifan Wen, Yuling Huang, Siyuan Cai, Letian Zhang, Kui Jiang, Shang Liu, Meng Lin, Matthew C. Beard, Zong-Xiang Xu* and Xihan Chen*

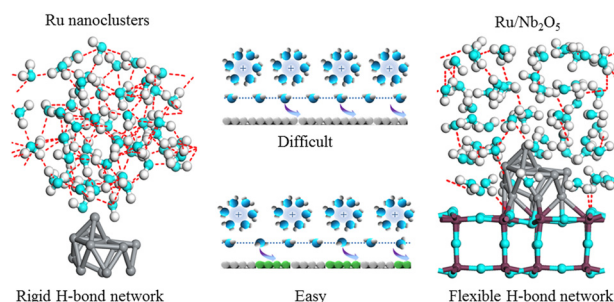


PAPERS

5091

Enhancing neutral hydrogen production by disrupting the rigid hydrogen bond network on Ru nanoclusters through Nb₂O₅-mediated water reorientation

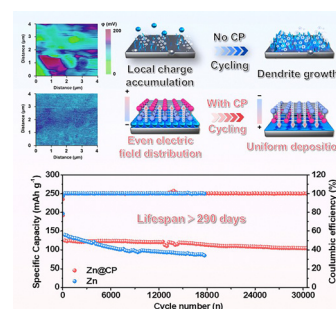
Xiao Hui Chen, Xiao Lin Li, Ting Li, Jia Huan Jia, Jing Lei Lei, Nian Bing Li* and Hong Qun Luo*



5102

Achieving reversible Zn chemistry by constructing a built-in internal electric field to dynamically eliminate local charge accumulation

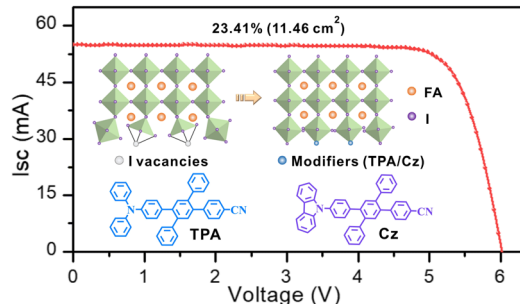
Xueru Yang, Zhaoyu Zhang, Yufei Zhang, Wencheng Du, Minghui Ye, Yongchao Tang, Zhipeng Wen, Xiaoqing Liu* and Cheng Chao Li*



5115

Organic emitters with near-unity photoluminescence to reinforce buried interface of perovskite solar cells and modules

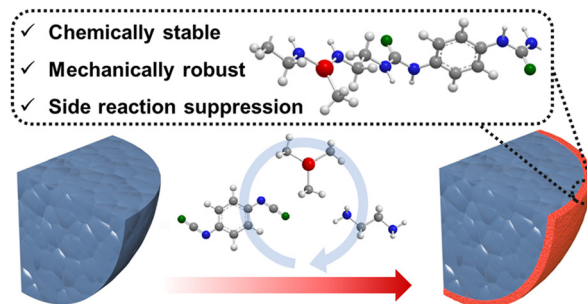
Zhen-Yang Suo, Guo-Bin Xiao, Zhenhuang Su, Runmin Dong, Xijiao Mu, Xingyu Gao, Yiying Wu and Jing Cao*



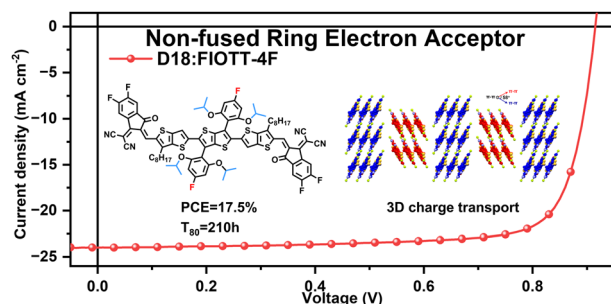
5124

A breathable inorganic–organic interface for fabricating a crack-free nickel-rich cathode with long-term stability

Yipeng Sun, Jinjin Ma, Duojie Wu, Changhong Wang, Yang Zhao, Matthew Zheng, Ruizhi Yu, Weihai Li, Minsi Li, Yingjie Gao, Xiaoting Lin, Hui Duan, Jiamin Fu, Zhiqiang Wang, Ruying Li, M. Danny Gu,* Tsun-Kong Sham* and Xueliang Sun*



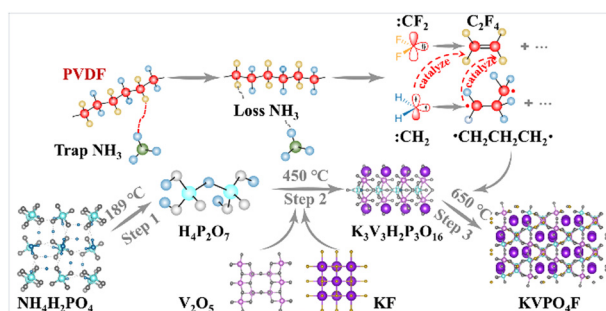
5137



Enhanced crystal network and charge transfer of non-fused ring electron acceptors via interchain interaction for efficient and stable organic solar cells

Shounuan Ye, Tianyi Chen, Jinyang Yu, Shanlu Wang, Shuixing Li,* Jingxi Wang, Yuang Fu, Yuxuan Zhu, Mengting Wang, Xinhui Lu, Zaifei Ma, Chang-Zhi Li, Minmin Shi* and Hongzheng Chen*

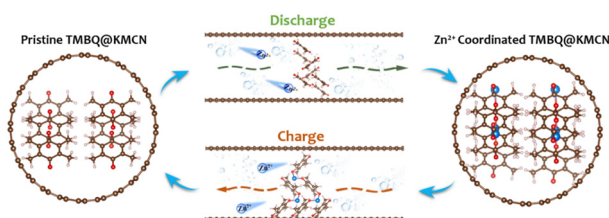
5147



Carbene-catalyzed synthesis of a fluorophosphate cathode

Qingfeng Fu, Wang Zhou, Peng Gao, Hongliang Dong, Shi Chen, Changling Fan* and Jilei Liu*

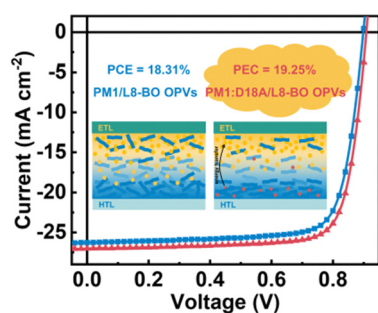
5162



Unveiling nanopore-confined crystallization and coordination/de-coordination mechanisms of quinone molecules for ultrahigh-rate and ultralong-cyclability aqueous zinc–organic batteries

Shuo Meng, Ting He,* Lu Chen, Kexuan Liao, Hang Lu, Tingting Liu, Ruijin Meng, Jie Ma, Chi Zhang* and Jinhu Yang*

5173



Over 19.2% efficiency of layer-by-layer organic photovoltaics enabled by a highly crystalline material as an energy donor and nucleating agent

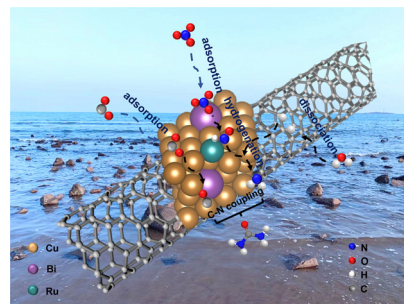
Hongyue Tian, Yuheng Ni, Wenqing Zhang, Yujie Xu, Bing Zheng, Sang Young Jeong, Sijian Wu, Zaifei Ma, Xiaoyan Du, Xiaotao Hao, Han Young Woo,* Lijun Huo, Xiaoling Ma* and Fujun Zhang*



5183

Achieving efficient urea electrosynthesis through improving the coverage of a crucial intermediate across a broad range of nitrate concentrations

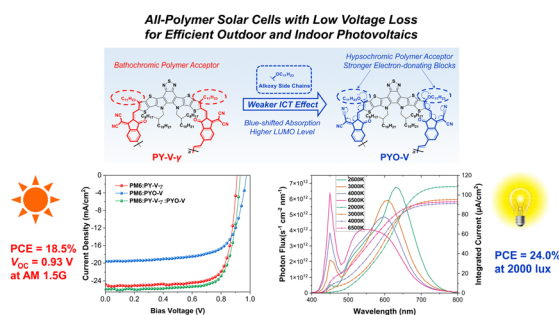
Yaodong Yu, Yuyao Sun, Jiani Han, Yujia Guan, Hongdong Li, Lei Wang and Jianping Lai*



5191

An efficient alkoxy-substituted polymer acceptor for efficient all-polymer solar cells with low voltage loss and versatile photovoltaic applications

Han Yu,* Chaoyue Zhao, Huawei Hu,* Shenbo Zhu, Bosen Zou, Top Archie Dela Peña, Ho Ming Ng, Chung Hang Kwok, Jicheng Yi, Wei Liu, Mingjie Li, Jiaying Wu, Guangye Zhang,* Yiwang Chen and He Yan*



5200

An ultra-high mass-loading transition metal phosphide electrocatalyst for efficient water splitting and ultra-durable zinc–air batteries

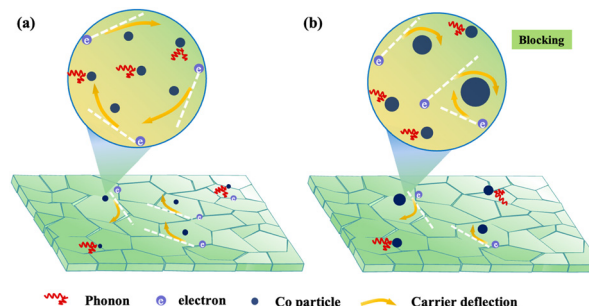
Navid Khodayar, Abolhassan Noori, Mohammad S. Rahmanifar, Masumeh Moloudi, Nasim Hassani, Mehdi Neek-Amal, Maher F. El-Kady, Nahla B. Mohamed, Xinhui Xia, Yongqi Zhang, Richard B. Kaner* and Mir F. Mousavi*



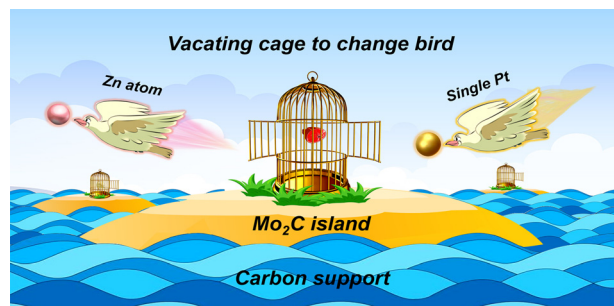
5216

Magnetism-induced diffuse scattering effect triggers excellent thermoelectric performance

Wei Song, Chuanqing Sun, Kangkang Yang, Shaoqiu Ke, Xiangyu Li, Mingrui Liu, Congli Sun,* Wenyu Zhao* and Qingjie Zhang



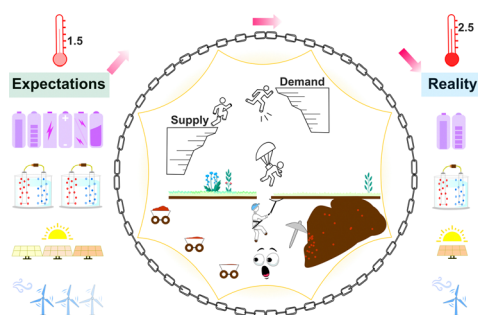
5227



Hierarchically stabilized Pt single-atom catalysts induced by an atomic substitution strategy for an efficient hydrogen evolution reaction

Changle Yue, Chao Feng, Guangxun Sun, Na Liu, Haoyuan Hao, Wenjing Bao, Xiaowei Zhang, Fengyue Sun, Cong Zhang, Jiahui Bi, Yan Zhou, Hsiao-Chien Chen, Yuan Pan,* Daofeng Sun and Yukun Lu*

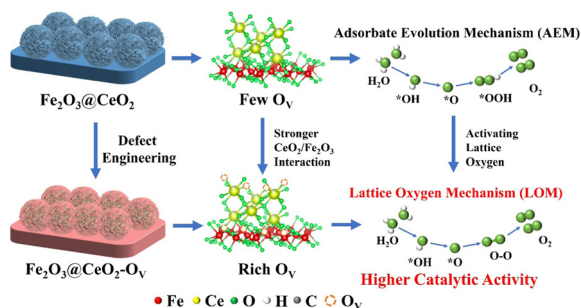
5241



Assessing the realism of clean energy projections

Fatemeh Rostami, Piera Patrizio, Laureano Jimenez, Carlos Pozo* and Niall Mac Dowell

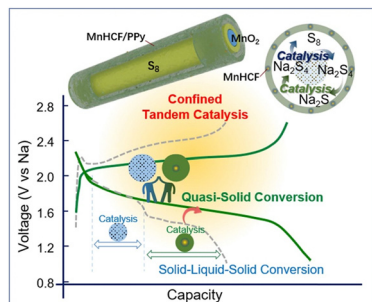
5260



Activating lattice oxygen by a defect-engineered $\text{Fe}_2\text{O}_3\text{-CeO}_2$ nano-heterojunction for efficient electrochemical water oxidation

Qiuping Huang, Guang-Jie Xia, Bo Huang, Dongling Xie, Jianan Wang, Dan Wen, Dunmin Lin, Chenggang Xu, Lei Gao, Zhenduo Wu, Jinqi Wu, Fengyu Xie,* Wenhan Guo* and Ruqiang Zou*

5273



Confined tandem catalytic quasi-solid sulfur reversible conversion for all-solid-state Na-S batteries

Weiwei Zhang, Bin Song, Mingli Wang, Tingting Miao, Xiang-Long Huang, Erhuan Zhang, Xiaowen Zhan, Yue Yang, Hong Zhang* and Ke Lu*



5283

Boosting the maximized output energy density of triboelectric nanogenerators

Ru Guo, Xin Xia, Hang Luo, Dou Zhang and Yunlong Zi*

