

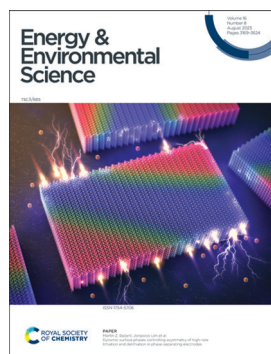
# Energy & Environmental Science

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ISSN 1754-5706 CODEN EESNBY 16(8) 3169-3624 (2023)



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### Inside cover

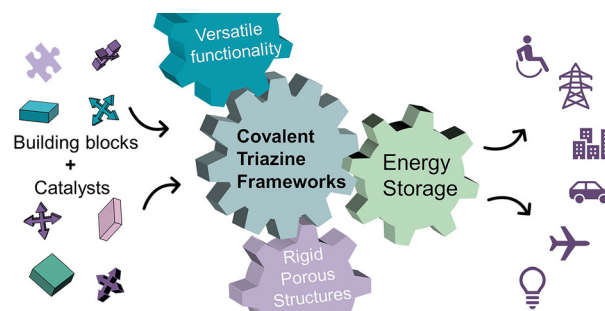
See Gonzalo Guillén-Gosálbez, Javier Pérez-Ramírez *et al.*, pp. 3314–3330. Image reproduced by permission of Javier Pérez-Ramírez from *Energy Environ. Sci.*, 2023, 16, 3314.

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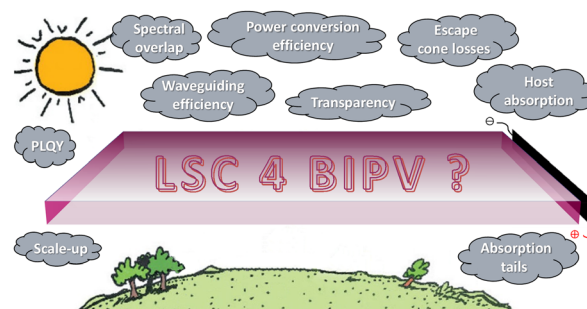
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Bryce S. Richards\* and Ian A. Howard



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Energy &amp; Environmental Science (EES)

(electronic; ISSN 1754-5706) is published 12 times a year by the Royal Society of Chemistry, Thomas Graham House, Science Park, Milton Road, Cambridge, CB4 0WF, UK.

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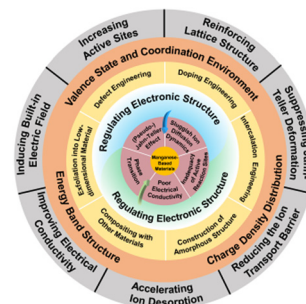


## REVIEWS

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### Regulating the electronic structure of manganese-based materials to optimize the performance of zinc-ion batteries

Anqi Zhang, Ran Zhao,\* Yahui Wang, JingJing Yang, Chuan Wu\* and Ying Bai\*

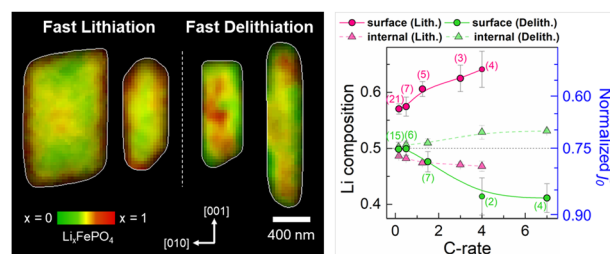


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### Dynamic surface phases controlling asymmetry of high-rate lithiation and delithiation in phase-separating electrodes

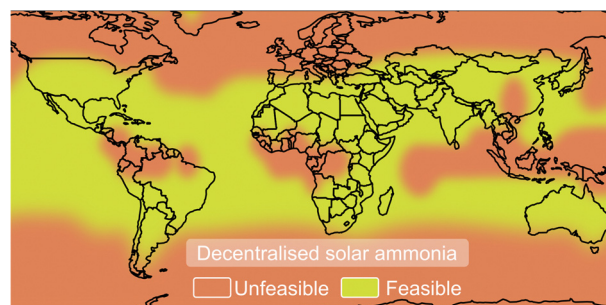
Bonho Koo, Jinkyu Chung, Juwon Kim, Dimitrios Fraggadakis, Sungjae Seo, Chihyun Nam, Danwon Lee, Jeongwoo Han, Sugeun Jo, Hongbo Zhao, Neel Nadkarni, Jian Wang, Namdong Kim, Markus Weigand, Martin Z. Bazant\* and Jongwoo Lim\*



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### Environmental and economic potential of decentralised electrocatalytic ammonia synthesis powered by solar energy

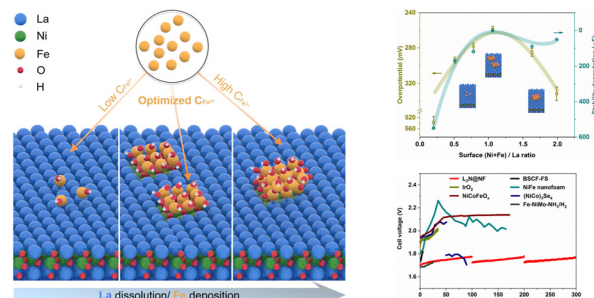
Sebastiano C. D'Angelo, Antonio J. Martín, Selene Cobo, Diego Freire Ordóñez, Gonzalo Guillén-Gosálbez\* and Javier Pérez-Ramírez\*



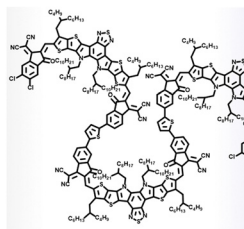
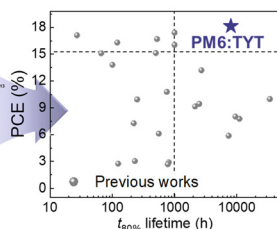
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### Tailoring the surface cation configuration of Ruddlesden–Popper perovskites for controllable water oxidation performance

Yu Li, Gao Chen,\* Hsiao-Chien Chen, Yanping Zhu, Liangshuang Fei, Longwei Xu, Tiancheng Liu, Jie Dai, Haitao Huang, Wei Zhou\* and Zongping Shao\*

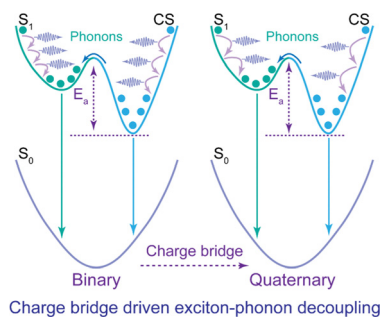


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**TYT  
(Trimerized SMA)**

**Efficient (PCE > 18%) &  
Stable ( $t_{80\%}$  > 8000 h) OSCs**

**Trimerized small-molecule acceptors enable  
high-performance organic solar cells with high  
open-circuit voltage and prolonged life-time**

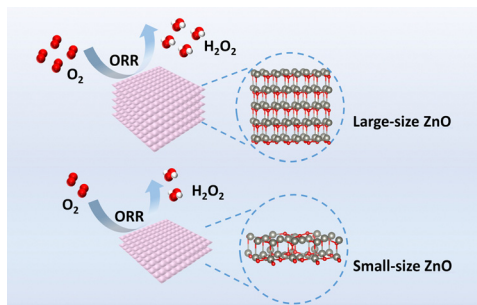
Jin-Woo Lee, Cheng Sun, Tan Ngoc-Lan Phan,  
Dong Chan Lee, Zhengping Tan, Hyesu Jeon,  
Shinuk Cho, Soon-Ki Kwon, Yun-Hi Kim\* and  
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decoupling enables efficient and photothermal  
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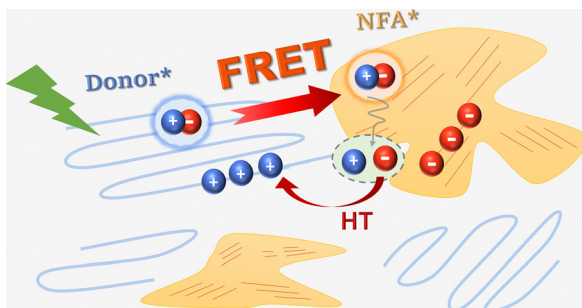
Kangning Zhang, Zhinan Jiang, Jiawei Qiao, Peng Lu,  
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**An abnormal size effect enables ampere-level O<sub>2</sub>  
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Shan Ding, Baokai Xia, Ming Li, Fengqian Lou, Chi Cheng,  
Tianqi Gao, Yuxiang Zhang, Kang Yang, Lili Jiang,  
Zhihao Nie, Hongxin Guan, Jingjing Duan and  
Sheng Chen\*

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**Ultrafast energy transfer from polymer donors  
facilitating spectral uniform photocurrent  
generation and low energy loss in high-efficiency  
nonfullerene organic solar cells**

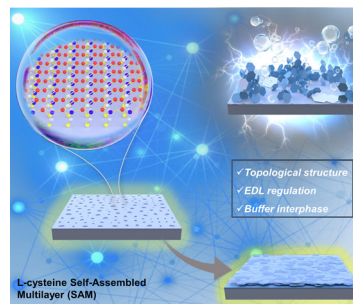
Zeng Chen, Chengliang He, Peng Ran, Xu Chen, Yao  
Zhang, Chi Zhang, Runchen Lai, Yang (Michael) Yang,  
Hongzheng Chen and Haiming Zhu\*



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### Self-assembled multilayers direct a buffer interphase for long-life aqueous zinc-ion batteries

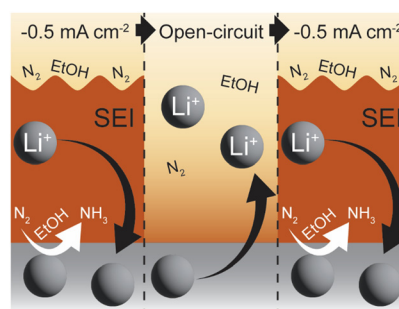
Dongmin Li, Yan Tang, Shuquan Liang, Bingan Lu, Gen Chen\* and Jiang Zhou\*



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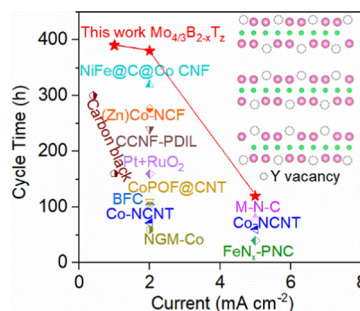
Sarah J. Blair, Mathieu Doucet,\* Valerie A. Niemann, Kevin H. Stone, Melissa E. Kreider, James F. Browning, Candice E. Halbert, Hanyu Wang, Peter Benedek, Eric J. McShane, Adam C. Nielander,\* Alessandro Gallo\* and Thomas F. Jaramillo\*



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### MBene promoted Zn peroxide chemistry in rechargeable near-neutral Zn–air batteries

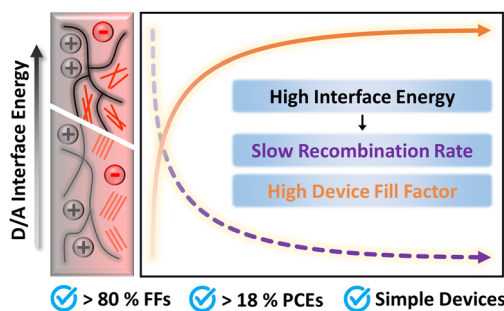
Yue Hou, Ze Chen, Xinliang Li, Yiqiao Wang, Pei Li, Huilin Cui, Rong Zhang, Shuo Yang, Shaoce Zhang and Chunyi Zhi\*



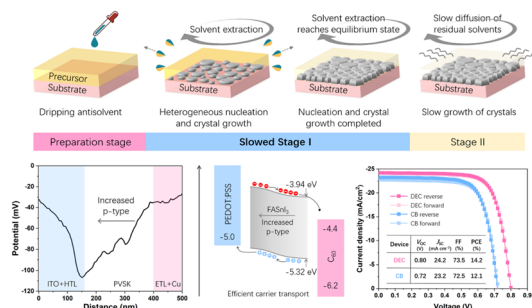
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### Interface property–functionality interplay suppresses bimolecular recombination facilitating above 18% efficiency organic solar cells embracing simplistic fabrication

Top Archie Dela Peña, Ruijie Ma,\* Zengshan Xing, Qi Wei, Jafar I. Khan, Ryan Michael Young, Yulong Hai, Sheena Anne Garcia, Xinhui Zou, Zijing Jin, Fai Lun Ng, King Lun Yeung, Dayne F. Swearer, Michael R. Wasielewski, Jiannong Wang, Hyojung Cha, He Yan, Kam Sing Wong, Gang Li,\* Mingjie Li\* and Jiaying Wu\*



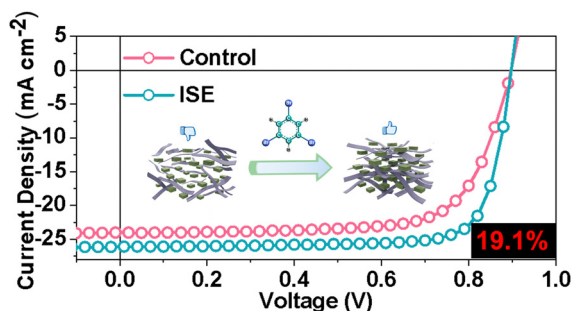
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### Green-antisolvent-regulated distribution of p-type self-doping enables tin perovskite solar cells with an efficiency of over 14%

Zhihao Zhang, Yuanfang Huang, Can Wang, Yiting Jiang, Jialun Jin, Jianbin Xu, Zicheng Li, Zhenhuang Su, Qin Zhou, Jingwei Zhu, Rui He, Da Hou, Huagui Lai, Shengqiang Ren,\* Cong Chen, Xingyu Gao, Tingting Shi, Walter Hu, Fan Fu, Peng Gao and Dewei Zhao\*

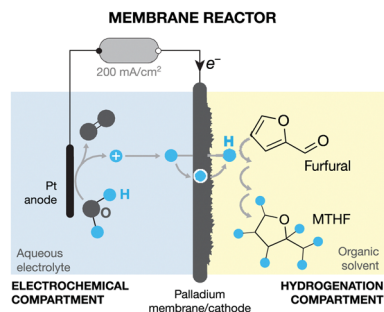
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### Film-formation dynamics coordinated by intermediate state engineering enables efficient thickness-insensitive organic solar cells

Xin Song,\* Hao Xu, Xinyu Jiang, Shengzheng Gao, Xinjie Zhou, Shanlei Xu, Junjun Li, Jian Yu, Wenzhu Liu, Weiguo Zhu\* and Peter Müller-Buschbaum

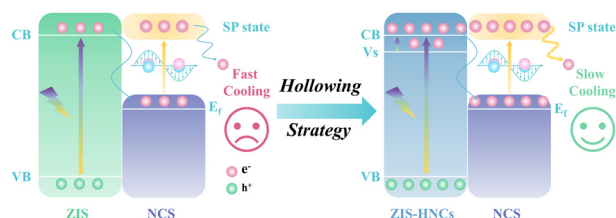
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Mia D. Stankovic, Jessica F. Sperry, Roxanna S. Delima, Connor C. Rupnow, Michael B. Rooney, Monika Stolar and Curtis P. Berlinguette\*

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### Efficient interfacial electron transfer induced by hollow-structured ZnIn<sub>2</sub>S<sub>4</sub> for extending hot electron lifetimes

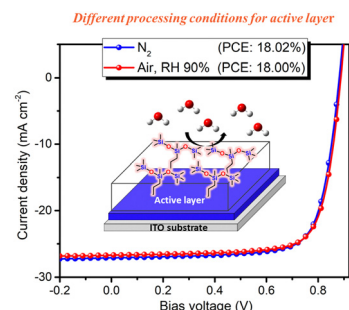
Yuchen Guo, Jiaming Sun, Yuan Tang, Xiaofang Jia, Yu Nie, Zikang Geng, Chunyang Wang, Junying Zhang,\* Xin Tan, Dichang Zhong, Jinhua Ye\* and Tao Yu\*



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## Siloxane-induced robust photoactive materials with high humidity tolerance for ambient processing of organic solar cells

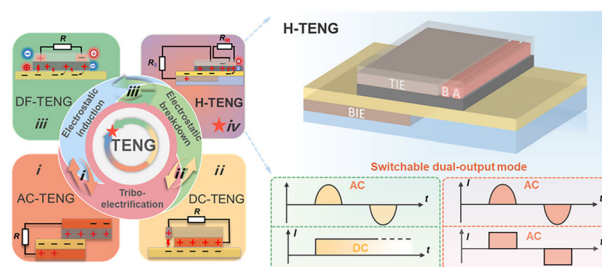
Haizhen Liu, Dong Yuan, Haiying Jiang, Suhan Li, Lianjie Zhang\* and Junwu Chen\*



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## A novel hybrid triboelectric nanogenerator based on the mutual boosting effect of electrostatic induction and electrostatic breakdown

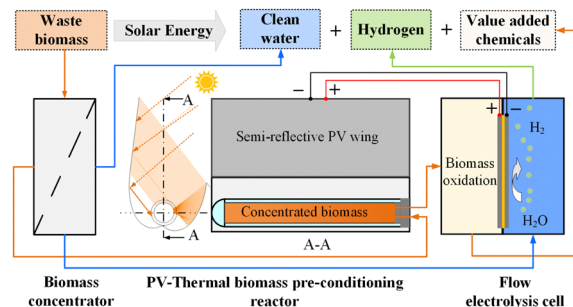
Ai Chen, Qixuan Zeng, Liming Tan, Fan Xu, Tingyu Wang, Xiaofang Zhang, Yanlin Luo and Xue Wang\*



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## A ternary system exploiting the full solar spectrum to generate renewable hydrogen from a waste biomass feedstock

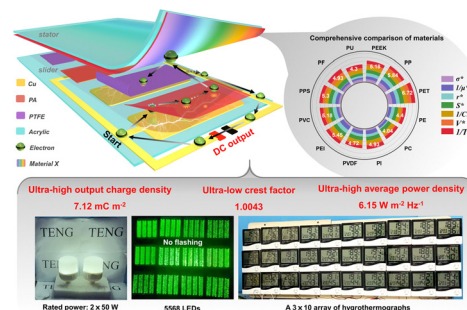
Qiyuan Li, Lixue Jiang, Gan Huang, Da-Wei Wang, Jack Shepherd, Rahman Daiyan, Christos N. Markides, Robert A. Taylor\* and Jason Scott\*



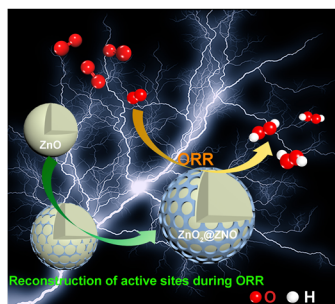
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## Overall performance improvement of direct-current triboelectric nanogenerators by charge leakage and ternary dielectric evaluation

Qianying Li, Shaoke Fu, Xiaochuan Li, Huilin Chen, Wencong He, Qianxi Yang, Xuemei Zhang, Huake Yang, Dahu Ren and Yi Xi\*



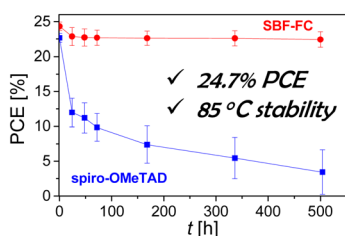
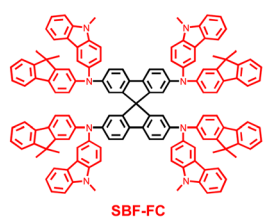
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### The operation active sites of O<sub>2</sub> reduction to H<sub>2</sub>O<sub>2</sub> over ZnO

Yunjie Zhou, Liang Xu, Jie Wu, Wenxiang Zhu, Tiwei He, Hao Yang, Hui Huang, Tao Cheng,\* Yang Liu\* and Zhenhui Kang\*

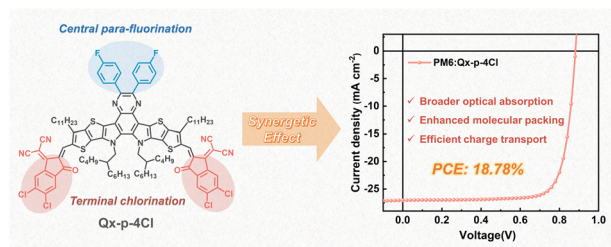
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### Spirobifluorene with an asymmetric fluorenylcarbazolamine electron-donor as the hole transport material increases thermostability and efficiency of perovskite solar cells

Yutong Ren, Yuefang Wei, Tianyu Li, Yanfei Mu, Min Zhang, Yi Yuan, Jing Zhang and Peng Wang\*

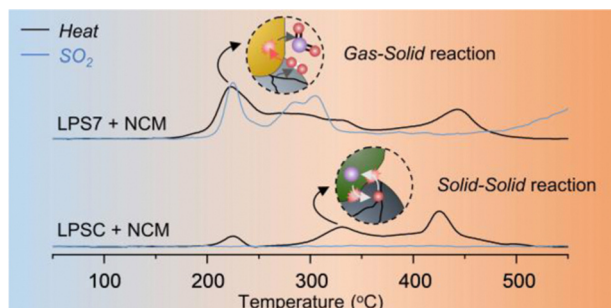
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### Selective halogenation of central and end-units of nonfullerene acceptors enables enhanced molecular packing and photovoltaic performance

Meiling Xie, Yanan Shi, Lingyun Zhu,\* Jianqi Zhang, Qian Cheng, Hao Zhang, Yangjun Yan, Mingquan Zhu, Huiqiong Zhou, Kun Lu\* and Zhixiang Wei

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### Distinct thermal runaway mechanisms of sulfide-based all-solid-state batteries

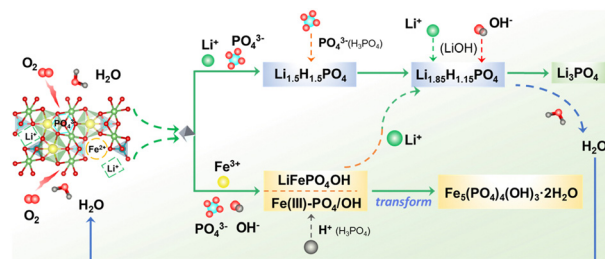
Xinyu Rui, Dongsheng Ren,\* Xiang Liu,\* Xiaodan Wang, Kuangyu Wang, Yao Lu, Linwei Li, Pengbo Wang, Gaolong Zhu, Yuqiong Mao, Xuning Feng, Languang Lu, Hewu Wang and Minggao Ouyang\*



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### Built-in anionic equilibrium for atom-economic recycling of spent lithium-ion batteries

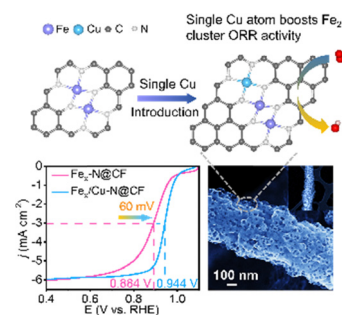
Pengfei Zhu, Zhipeng Jiang, Wei Sun, Yue Yang, Debbie S. Silvester, Hongshuai Hou, Craig E. Banks, Jiugang Hu\* and Xiaobo Ji\*



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### Single Cu–N<sub>4</sub> sites enable atomic Fe clusters with high-performance oxygen reduction reactions

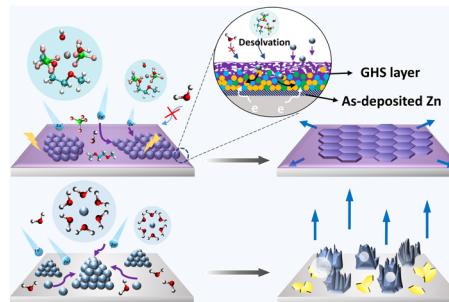
Shuwen Wu, Shang Jiang, Shao-Qing Liu, Xuehai Tan, Ning Chen, Jing-Li Luo, Samir H. Mushrif, Ken Cadien and Zhi Li\*



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### A eutectic electrolyte for an ultralong-lived Zn//V<sub>2</sub>O<sub>5</sub> cell: an *in situ* generated gradient solid-electrolyte interphase

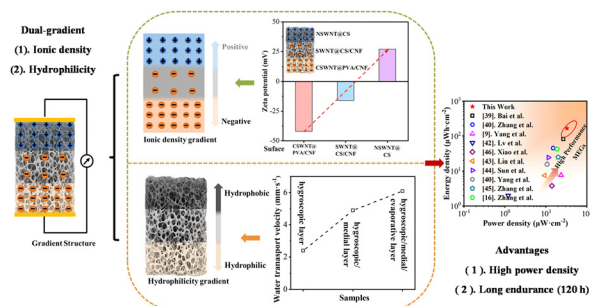
Chao Meng, Wei-Dong He, Hao Tan, Xing-Long Wu,\* Hong Liu\* and Jian-Jun Wang\*



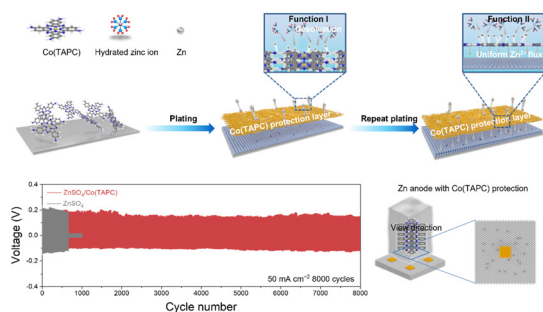
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### Double-gradient-structured composite aerogels for ultra-high-performance moisture energy harvesting

Xuezhong Zhang, Zijian Dai, Jie Chen, Xin Chen, Xiong Lin, Shuang Yang, Kai Wu, Qiang Fu\* and Hua Deng\*



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## Engineering an electrostatic field layer for high-rate and dendrite-free Zn metal anodes

Kaiping Zhu, Can Guo, Wenbin Gong, Qinghua Xiao, Yagang Yao, Kenneth Davey, Qinghong Wang,\* Jianfeng Mao,\* Pan Xue\* and Zaiping Guo\*

