

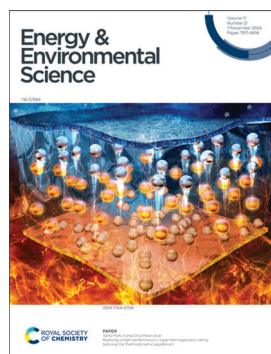
# Energy & Environmental Science

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### Inside cover

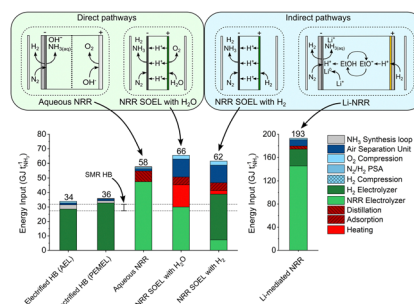
See Hyojung Cha, Taiho Park *et al.*, pp. 7999–8018. Image reproduced by permission of Taiho Park and Hyojung Cha from *Energy Environ. Sci.*, 2024, 17, 7999.

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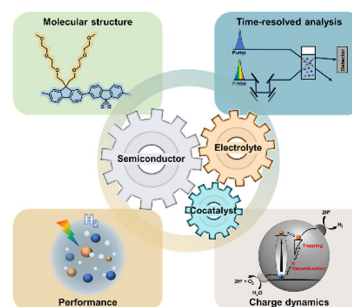


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### Understanding charge carrier dynamics in organic photocatalysts for hydrogen evolution

Jinhyuk Choi, Wooteak Jung, Soranyel Gonzalez-Carrero, James R. Durrant, Hyojung Cha\* and Taiho Park\*



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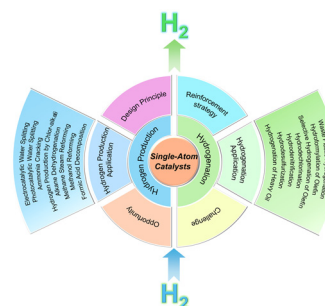
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## REVIEWS

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### Rational design principles of single-atom catalysts for hydrogen production and hydrogenation

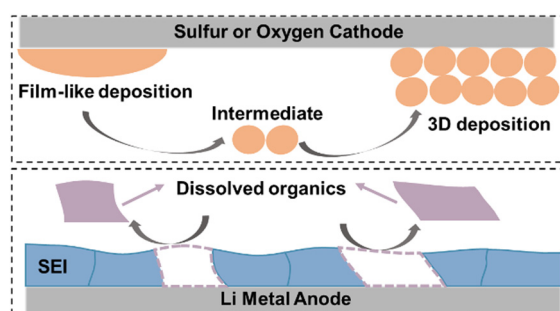
Zhidong Wang, Xinyue Yuan, Han Guo, Xin Zhang, Jiatian Peng and Yuan Pan\*



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### Understanding and applying the donor number of electrolytes in lithium metal batteries

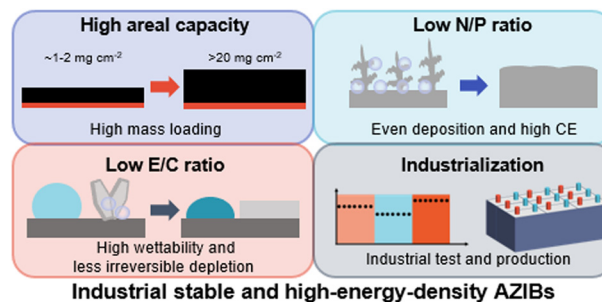
Pan Zhou, Yong Xiang\* and Kai Liu\*



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### Challenges and industrial considerations towards stable and high-energy-density aqueous zinc-ion batteries

Yida Hu, Peiyuan Wang, Mingzhu Li, Zhexuan Liu, Shuquan Liang and Guozhao Fang\*

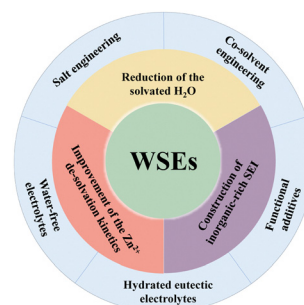


## MINIREVIEW

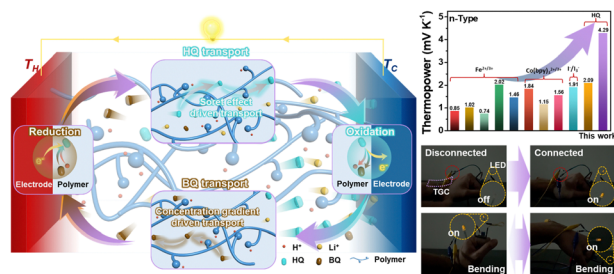
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### Constructing weakly solvating electrolytes for next-generation Zn-ion batteries

Diyu Xu, Dezhou Zheng, Fuxin Wang,\* Xuefeng Shang,\* Yi Wang\* and Xihong Lu\*



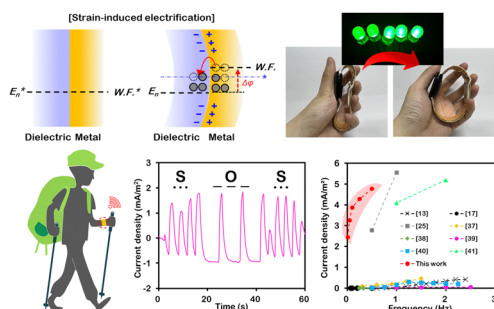
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### Realizing a high-performance n-type thermogalvanic cell by tailoring the thermodynamic equilibrium

Sungryong Kim, Jin Han Kwon, Yurim Bae, Jeongsu Kim, Taiho Park\* and Hong Chul Moon\*

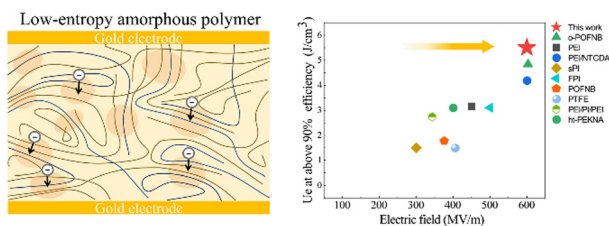
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### Strain-induced electrification-based flexible nanogenerator for efficient harvesting from ultralow-frequency vibration energy at 0.5–0.01 Hz

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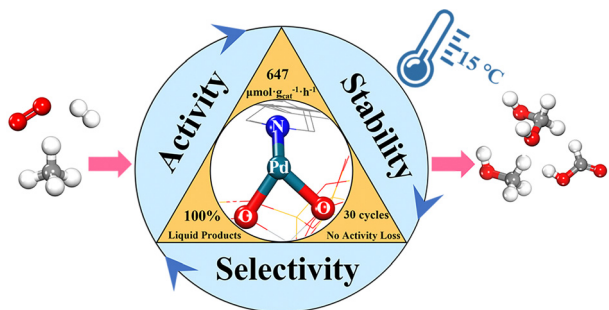
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### Low-entropy amorphous dielectric polymers for high-temperature capacitive energy storage

Qiyang Zhang,\* Dongmou Li, Yueqi Zhong, Yuna Hu, Shuangwu Huang,\* Shuxiang Dong and Q. M. Zhang\*

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### Surface hydroxyl group dominating aerobic oxidation of methane below room temperature

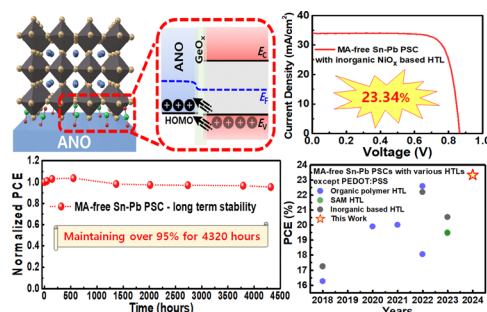
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## Unprecedented inorganic HTL-based MA-free Sn–Pb perovskite photovoltaics with an efficiency over 23%

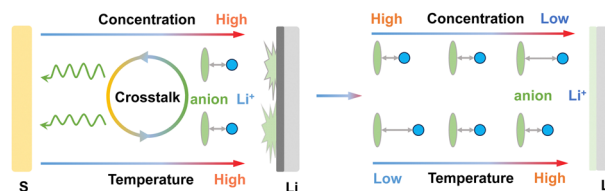
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## Electrolyte engineering for thermally stable Li–S batteries operating from $-20\text{ }^{\circ}\text{C}$ to $100\text{ }^{\circ}\text{C}$

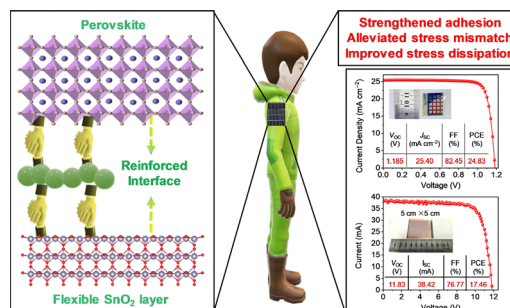
Dong Guo, Simil Thomas, Jehad K. El-Demellawi, Zixiong Shi, Zhiming Zhao, Christian G. Canlas, Yongjiu Lei, Jian Yin, Yaping Zhang, Mohamed Nejib Hedhili, Muhammad Arsalan, Yunpei Zhu, Osman M. Bakr, Omar F. Mohammed and Husam N. Alshareef\*



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## Interlayer reinforcement for improved mechanical reliability for wearable perovskite solar cells

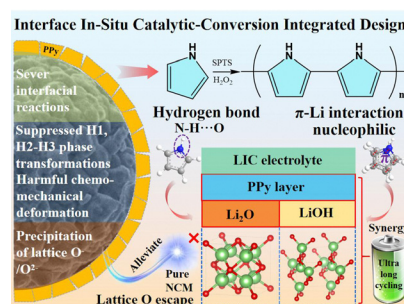
Weilun Cai, Pengchen Zou, Shiqi Rong, Hui Wang, Xin Chen, Zheng Zhang, Yajie Wang, Chou Liu, Tinghuan Yang, Tianqi Niu, Shengye Jin, Wenming Tian,\* Jianxi Yao,\* Shengzhong (Frank) Liu\* and Kui Zhao\*



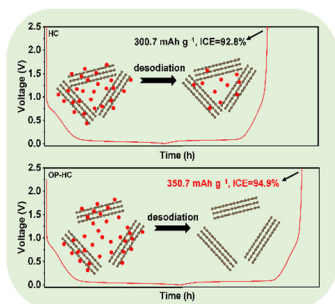
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Xuanyi Zhou, Biao Zhang, Pengbo Lyu, Lei Xi, Fangkun Li, Zengsheng Ma, Min Zhu and Jun Liu\*



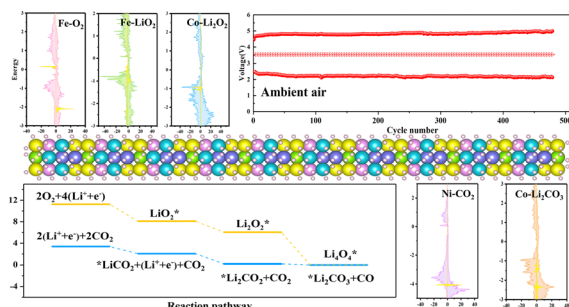
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### Hard carbon with an opened pore structure for enhanced sodium storage performance

Shunzhang You, Qiaobao Zhang, Junxiang Liu, Qiang Deng, Zhefei Sun, Dandan Cao, Tongchao Liu,\* Khalil Amine\* and Chenghao Yang\*

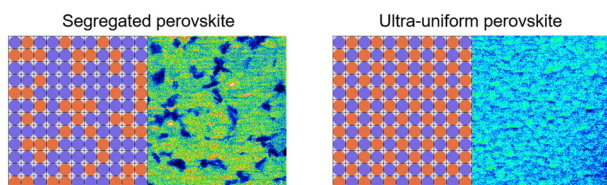
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### A high-entropy cathode catalyst with multiphase catalytic capability of $\text{Li}_2\text{O}_2$ and $\text{Li}_2\text{CO}_3$ enabling ultralong cycle life in Li-air batteries

Xia Li, Guoliang Zhang, Dongmei Zhang, Ruonan Yang, Han Yu, Xiuqi Zhang, Gang Lian, Hua Hou, Zhanhu Guo, Chuanxin Hou, Xiaoyang Yang and Feng Dang\*

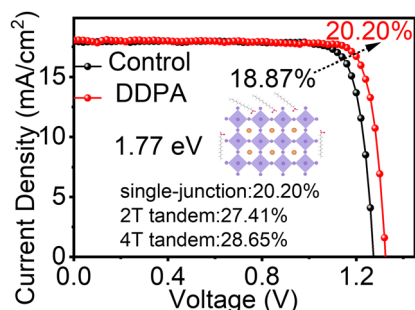
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### Ultra-uniform perovskite crystals formed in the presence of tetrabutylammonium bistriflimide afford efficient and stable perovskite solar cells

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### Efficient 1.77 eV-bandgap perovskite and all-perovskite tandem solar cells enabled by long-alkyl phosphonic acid

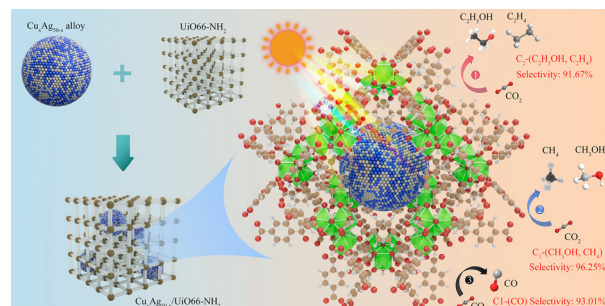
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### An innovative $\text{Cu}_x\text{Ag}_{50-x}/\text{UiO66-NH}_2$ photocatalyst prepared using a dual ship bottling strategy for photocatalytic $\text{CO}_2$ reduction: controlled product selectivity and pathways

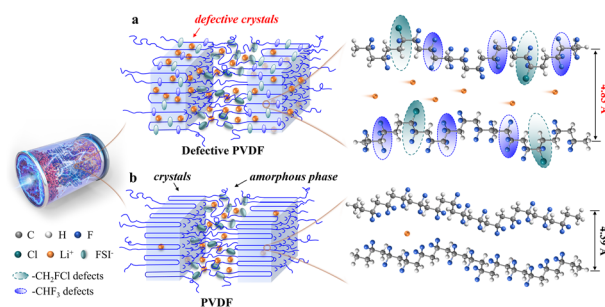
Lipeng Jiang, Dengqian Chen, Zhengkai Hao, Dongxue Cao, Runqiao Liu, Jingyu Cheng, Limei Chen, Xin Liu, Boyin Jia and Dongdong Liu\*



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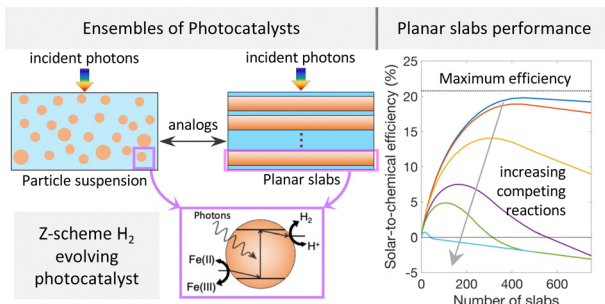
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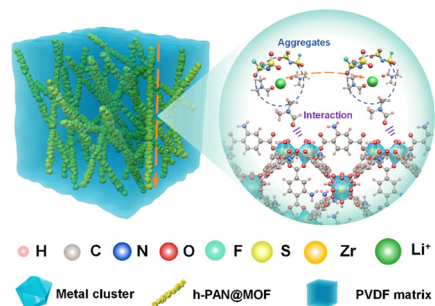
Luisa Barrera, Bradley W. Layne, Zejie Chen, Kenta Watanabe, Akihiko Kudo, Daniel V. Esposito, Shane Ardo and Rohini Bala Chandran\*



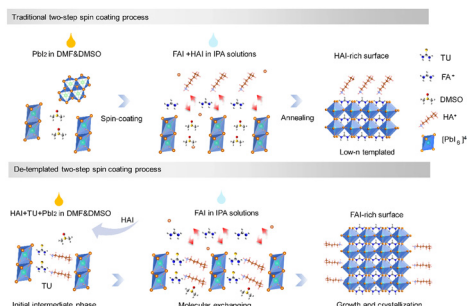
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### Competitive Li-ion coordination for constructing a three-dimensional transport network to achieve ultra-high ionic conductivity of a composite solid-state electrolyte

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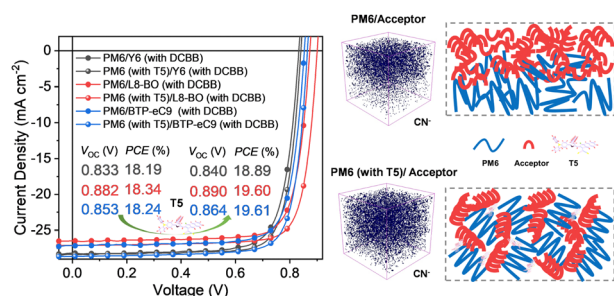
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## De-templated crystallization in 2D perovskites for enhanced photovoltaic efficiency

Fang Zeng, Zhenhuang Su, Weiyu Kong,\* Feng Li,\* Yuhang Liang, Xingmo Zhang, Tao Wang, Lin Zhang, Yuze Lvtao, Runkai Liu, Xingyu Gao, Jun Huang, Xudong Yang\* and Rongkun Zheng\*

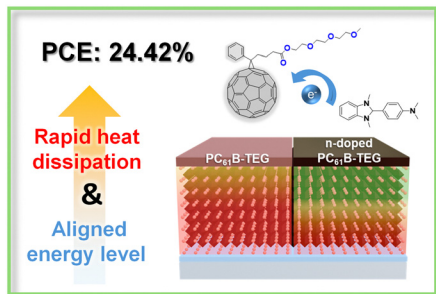
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## A three-dimensional solid additive suppresses non-radiative recombination loss to boost efficiency and scalability in organic photovoltaics

Zhongjie Li, Lingling Zhan,\* Huayu Qiu, Xiaokang Sun, Hanlin Hu, Ruohua Gui, Hang Yin, Rui Sun, Jie Min, Jinyang Yu, Weifei Fu, Weiming Qiu, Zhi-Xi Liu,\* Shouchun Yin\* and Hongzheng Chen\*

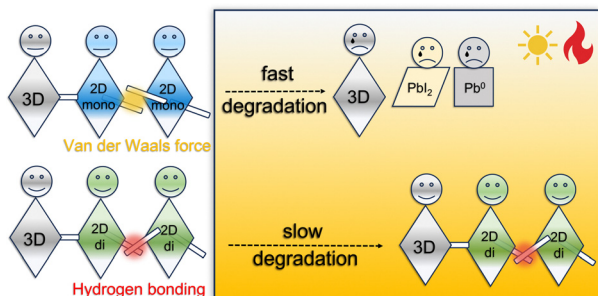
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## Synergistic enhancement of charge extraction and heat dissipation in inverted perovskite solar cells via n-doped top interlayers

Sangmi Park, Sang Young Jeong, Jaehoon Kim, Heunjeong Lee, Hye Seung Kim, Young Wook Noh, Ye In Kim, Shinuk Cho, Joon Sang Kang,\* Han Young Woo\* and Myoung Hoon Song\*

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## Revealing degradation mechanisms in 3D/2D perovskite solar cells under photothermal accelerated ageing

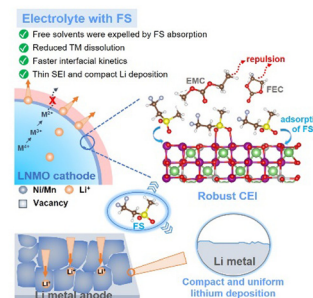
Zijian Peng,\* Andrej Vincze, Fabian Streller, Vincent M. Le Corre, Kaicheng Zhang, Chaohui Li, Jingjing Tian, Chao Liu, Junsheng Luo, Yicheng Zhao, Andreas Späth, Rainer Fink, Thomas Heumüller, Andres Osvet, Ning Li, Martin Stolterfoht, Larry Luer\* and Christoph J. Brabec\*



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### Rational molecular design of electrolyte additive endows stable cycling performance of cobalt-free 5 V-class lithium metal batteries

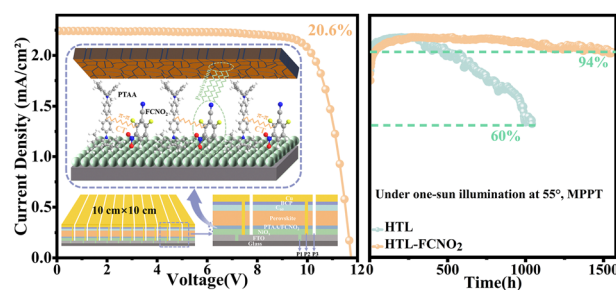
Wen-hui Hou, Yu Ou, Tianyou Zeng, Qingqing Feng, Qingbin Cao, Pan Zhou, Yingchun Xia, Xuan Song, Weili Zhang, Yang Lu, Shuaishuai Yan, Hang-yu Zhou, Haiyu Zhou, Hao Liu, Fengxiang Liu and Kai Liu\*



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### Electrophilic molecule-induced $\pi$ - $\pi$ interactions reduce energy disorder of the hole transport layer for highly efficient perovskite solar modules

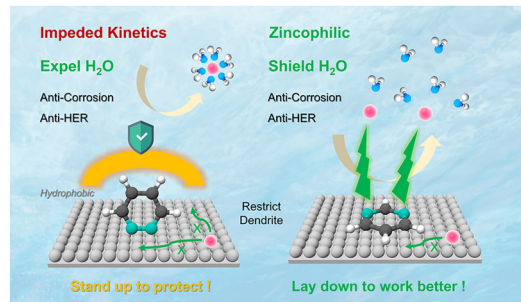
Lei Wang, Shihao Yuan,\* Feng Qian, Ting Zhang, Hualin Zheng, Xiaobo Li, Tianyu Lan, Qien Xu, Peng Zhang and Shibin Li\*



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### Understanding the structure–activity relationship of additives for durable Zn metal batteries: a case study of aromatic molecules

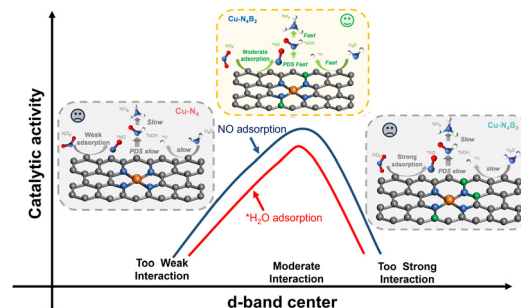
Da-Qian Cai, Haiyang Cheng, Jin-Lin Yang, Huan Liu, Tao Xiao, Xin Liu, Minghua Chen and Hong Jin Fan\*



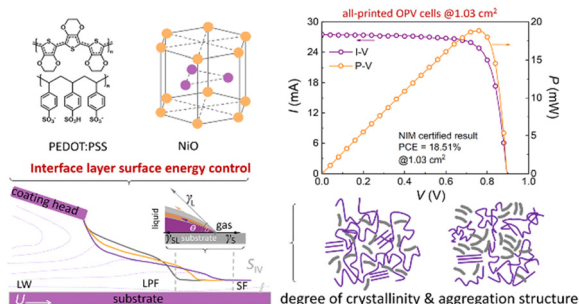
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### Coordination environment-tailored electronic structure of single atomic copper sites for efficient electrochemical nitrate reduction toward ammonia

Tianchi Huang, Taiyu Liang, Jiao You, Qihua Huo, Shuai Qi, Jingwen Zhao, Na Meng, Jinglian Liao, Chunyan Shang, Hengpan Yang, Qi Hu\* and Chuanxin He\*



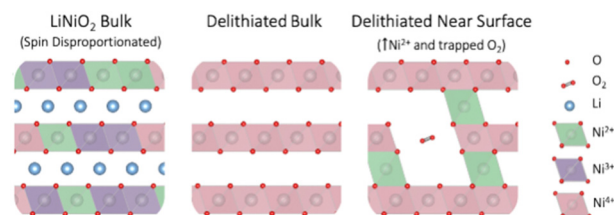
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### Interlayer surface energy control for high-efficiency printed organic photovoltaic cells

Jianqiu Wang, Yafei Wang, Mengzhen Du, Yue Yu, Chaoyi Wang, Wenxuan Wang, Qing Guo, Yong Cui, Shaoqing Zhang and Jianhui Hou\*

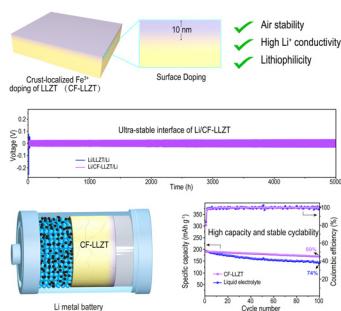
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### Distinguishing bulk redox from near-surface degradation in lithium nickel oxide cathodes

Lijin An, Jack E. N. Swallow, Peixi Cong, Ruomu Zhang, Andrey D. Poletayev, Erik Björklund, Pravin N. Didwal, Michael W. Fraser, Leanne A. H. Jones, Conor M. E. Phelan, Namrata Ramesh, Grant Harris, Christoph J. Sahle, Pilar Ferrer, David C. Grinter, Peter Bencok, Shusaku Hayama, M. Saiful Islam, Robert House, Peter D. Nellist, Robert J. Green, Rebecca J. Nicholls and Robert S. Weatherup\*

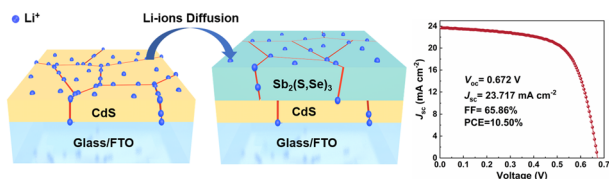
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### Air-stable and lithium-compatible garnet pellet enabled by surface doping for high-performance solid-state batteries

Sijie Guo, Ting-Ting Wu, Si-Qi Lu, Su-Ting Weng, Mu-Yao Qi, Bing Li, Yong-Gang Sun, Si-Dong Zhang, Xue-Feng Wang, Hong-Shen Zhang and An-Min Cao\*

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### Heterojunction lithiation engineering and diffusion-induced defect passivation for highly efficient $\text{Sb}_2(\text{S,Se})_3$ solar cells

Cong Liu,\* Anweng Gong, Chen Zuo, Tao Liu,\* Xiaoyang Liang, Donglou Ren, Kai Shen, Jianzha Zheng, Qifan Xue, Zhiqiang Li, Ruud E. I. Schropp, Bingsuo Zou\* and Yaohua Mai\*

