

# Journal of Materials Chemistry A

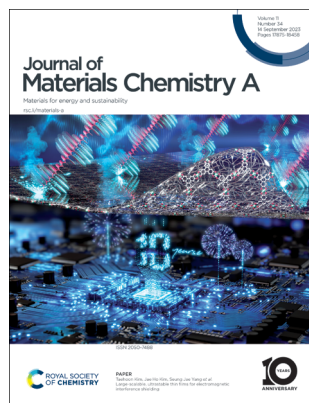
Materials for energy and sustainability

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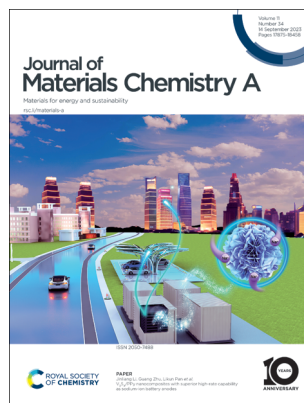
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ISSN 2050-7488 CODEN JMCAET 11(34) 17875–18458 (2023)



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### Inside cover

See Jinliang Li, Guang Zhu, Likun Pan *et al.*, pp. 18089–18096. Image reproduced by permission of Jinliang Li from *J. Mater. Chem. A*, 2023, **11**, 18089.

## EDITORIAL

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### Introduction to 1D/2D materials for energy, medicine and devices

Yu Chen, Gemma-Louise Davies,\* Anders Hagfeldt and Nicholas Kotov

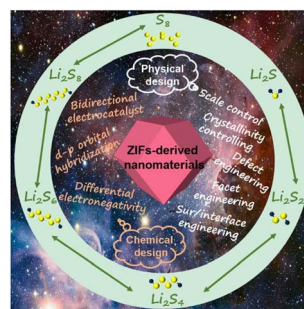


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### Recent progress in zeolitic imidazolate frameworks (ZIFs)-derived nanomaterials for effective lithium polysulfide management in lithium–sulfur batteries

Mengjie Zhang, Hanshu Mao, Yeru Liang and Xiaoyuan Yu\*



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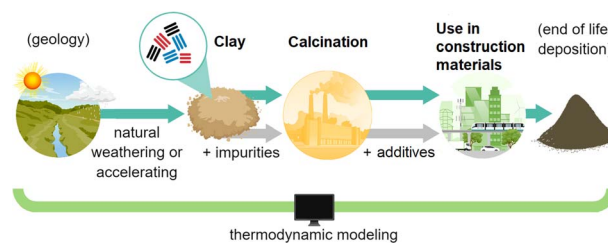


## REVIEWS

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### Thermodynamics of calcined clays used in cementitious binders: origin to service life considerations

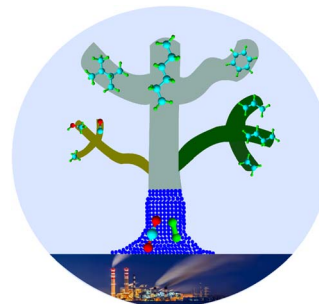
Theodore Hanein,\* Hoang Nguyen, John L. Provis, Claire Utton and Wolfgang Kunther



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### Selective CO<sub>2</sub> hydrogenation over zeolite-based catalysts for targeted high-value products

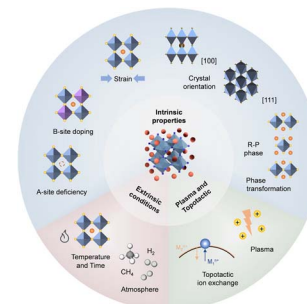
Penghui Yan, Hong Peng,\* John Vogrin, Hesamoddin Rabiee and Zhonghua Zhu\*



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### Recent advances in exsolved perovskite oxide construction: exsolution theory, modulation, challenges, and prospects

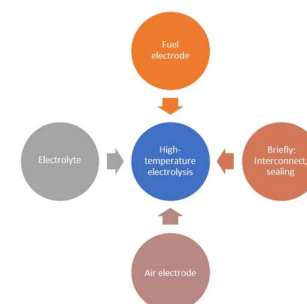
Zhao Sun, Chencun Hao, Sam Toan, Rongjun Zhang, Hongwei Li, Yu Wu, Hanzi Liu and Zhiqiang Sun\*



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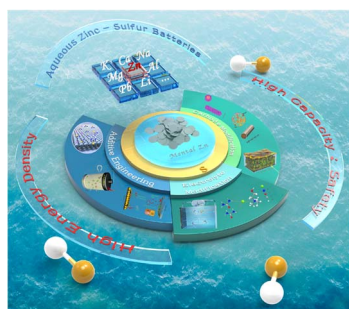
### Solid oxide electrolysis cells – current material development and industrial application

Stephanie E. Wolf, Franziska E. Winterhalder, Vaibhav Vibhu, L. G. J. (Bert) de Haart, Olivier Guillon, Rüdiger-A. Eichel and Norbert H. Menzler\*



## REVIEWS

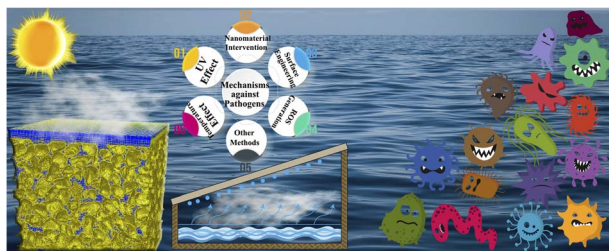
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### Recent advances in aqueous zinc–sulfur batteries: overcoming challenges for sustainable energy storage

Chenlong Feng, Xinyuan Jiang, Qiuping Zhou, Tongsuo Li, Yufei Zhao, Zhaojian Niu, Yuchao Wu, He Zhou, Mengyao Wang, Xuecheng Zhang, Ming Chen, Lubin Ni,\* Guowang Diao\* and Yongge Wei\*

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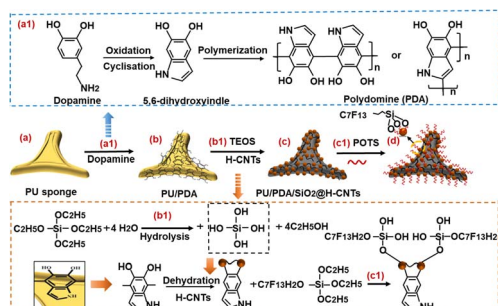


### Advanced nanostructured materials in solar interfacial steam generation and desalination against pathogens: combatting microbial-contaminants in water – a critical review

Seyed Masoud Parsa,\* Fatemeh Norozpour, Saba Momeni, Shahin Shoeibi, Xiangkang Zeng, Zafar Said, Wenshan Guo, Huu Hao Ngo and Bing-Jie Ni

## COMMUNICATION

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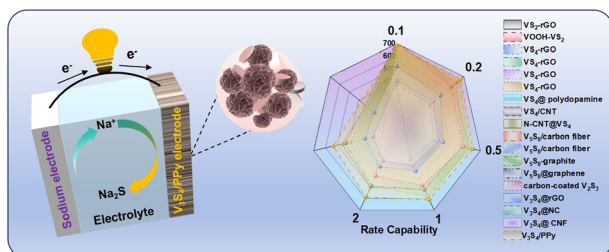


### Interfacial assembly of a durable superhydrophobic polyurethane sponge with "scalelike" structures for efficient oily emulsion separation

Zhanjian Liu,\* Jinyue Yang, Jing Jing, Xiguang Zhang, Yuxin Fu, Meiling Li, Ruixia Yuan and Huaiyuan Wang

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### V<sub>3</sub>S<sub>4</sub>/PPy nanocomposites with superior high-rate capability as sodium-ion battery anodes

Yajuan Zhang, Yue Li, Guangzhen Zhao, Lu Han, Ting Lu, Jinliang Li,\* Guang Zhu\* and Likun Pan\*

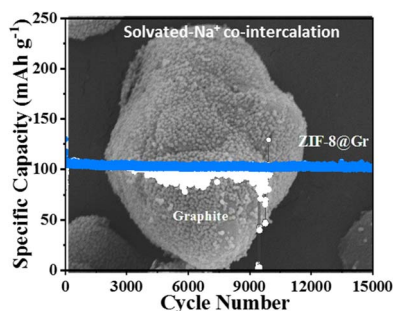




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### ZIF-8 coating on graphite: a high-rate and long-term cycling anode for sodium-ion capacitors

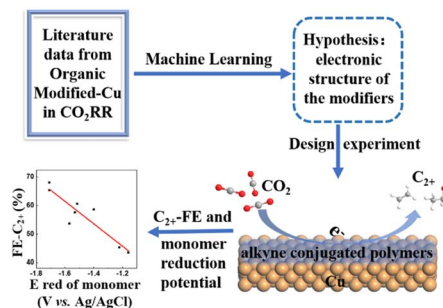
Xueying Liang, Zhifei Mao, Xiaojun Shi, Taoqiu Zhang, Zhi Zheng, Jun Jin, Beibei He, Rui Wang, Yansheng Gong and Huanwen Wang\*



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### Uncovering the influence of the modifier redox potential on CO<sub>2</sub> reduction through combined data-driven machine learning and hypothesis-driven experimentation

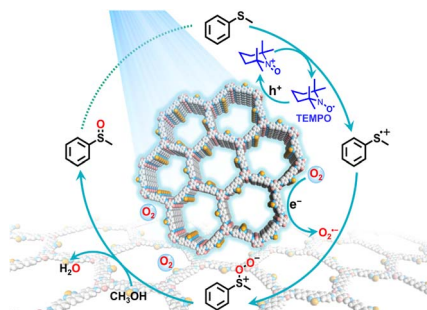
Xinru He, Yuming Su, Jieyu Zhu, Nan Fang, YangTao Chen, Huichong Liu, Da Zhou\* and Cheng Wang\*



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### The synergy between a benzoselenadiazole covalent organic framework and TEMPO for selective photocatalytic aerobic oxidation of organic sulfides

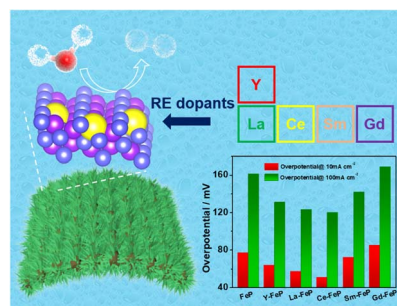
Hongxiang Zhao, Fulin Zhang, Xiaoyun Dong and Xianjun Lang\*



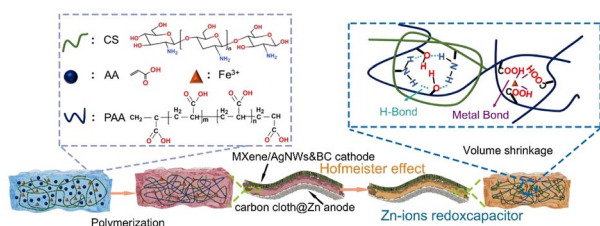
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### Engineering the electronic structure of FeP with rare earth elements to enhance the electrocatalytic hydrogen evolution performance

Wei Gao, Yujie Wu, Xinhao Wan, Jie Gao and Dan Wen\*



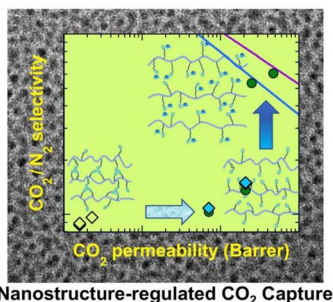
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### A Hofmeister effect induced hydrogel electrolyte–electrode interfacial adhesion enhancement strategy for energy-efficient and mechanically robust redoxcapacitors

Yuehui Du, Funian Mo,\* Chengbing Qin, Derek Ho and Haibo Hu\*

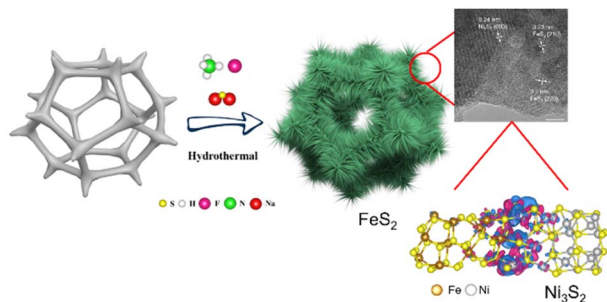
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### High-performance carbon-capture membranes developed by (non)solvent-induced nanostructural rearrangement in Nafion

Jing Wei, Jing Deng, Yulei Ma, Zikang Qin, Bangda Wang, Liyuan Deng,\* Richard J. Spontak and Zhongde Dai\*

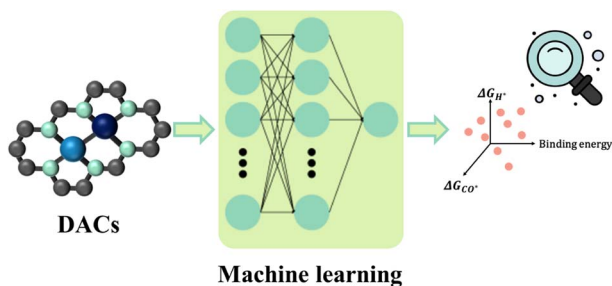
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### A highly efficient heterostructure nanorod bifunctional electrocatalyst for realizing enhanced overall water splitting at a large current density

Derun Li, Shixin Wu, Tao Jiang, Shuangshuang Huang, Zhaowu Wang,\* Hengyi Wu, Guangxu Cai and Feng Ren\*

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### Data-driven design of double-atom catalysts with high H<sub>2</sub> evolution activity/CO<sub>2</sub> reduction selectivity based on simple features

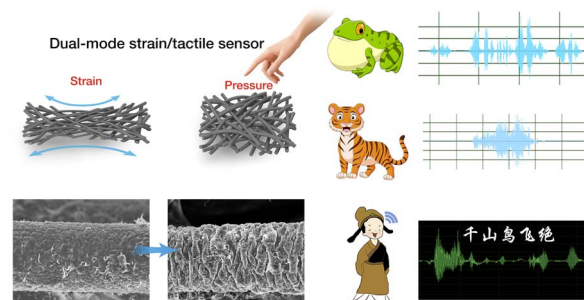
Chenyang Wei, Dingyi Shi, Zhaohui Yang, Zhimin Xue,\* Shuzi Liu, Ruiqi Li\* and Tiancheng Mu\*



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## Presenting the shape of sound through a dual-mode strain/tactile sensor

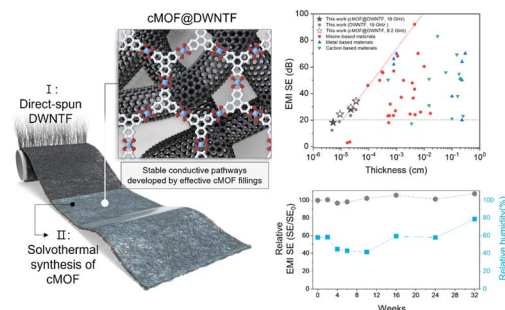
Kangqi Chang, Jiancheng Dong, Yanheng Mao, Yidong Peng, Lei Pu, Jian Meng, Minhao Guo, Piming Ma, Yunpeng Huang\* and Tianxi Liu\*



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## Large-scalable, ultrastable thin films for electromagnetic interference shielding

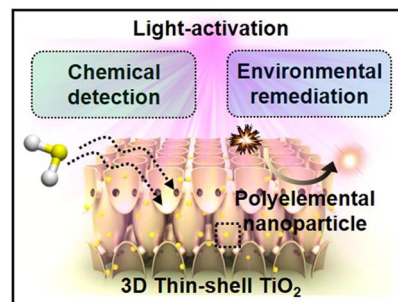
Jae Seo Park, Ji Yong Park, Kyunbae Lee, Young Shik Cho, Hyunji Shin, Yeonsu Jung, Chong Rae Park, Taehoon Kim,\* Jae Ho Kim\* and Seung Jae Yang\*



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## Atomically mixed catalysts on a 3D thin-shell TiO<sub>2</sub> for dual-modal chemical detection and neutralization

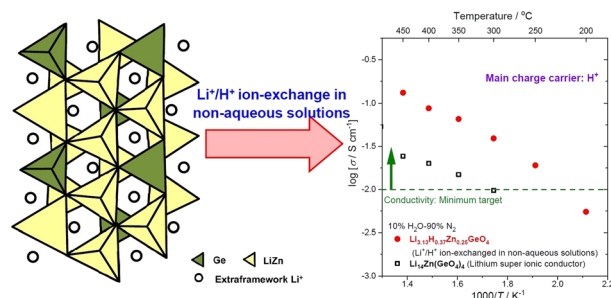
Joonchul Shin, Geonhee Lee, Myungwoo Choi, Huiwon Jang, Yunsung Lim, Gwang-Su Kim, Sang-Hyeon Nam, Seung-Hyub Baek, Hyun-Cheol Song, Jihan Kim, Chong-Yun Kang, Jeong-O. Lee,\* Seokwoo Jeon,\* Donghwi Cho\* and Ji-Soo Jang\*



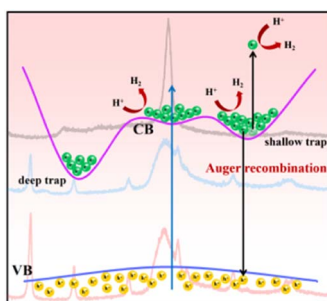
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## Intermediate-temperature proton conductivity of Li<sup>+</sup>/H<sup>+</sup> ion-exchanged material (Li,H)<sub>3.5</sub>Zn<sub>0.25</sub>GeO<sub>4</sub>

Toshiaki Matsui,\* Takashi Ozeki, Kazunari Miyazaki, Sadahiro Nagasaka, Hiroki Muroyama, Kenichi Imagawa, Yoshimi Okada and Koichi Eguchi



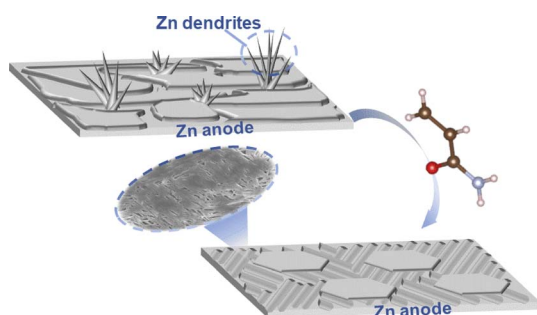
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### Sodium ion doped graphitic carbon nitride with high crystallinity for superior photocatalytic hydrogen evolution efficiency

Xue Han, Yuna Kang, Shuang Song, Rong Lu\* and Anchi Yu\*

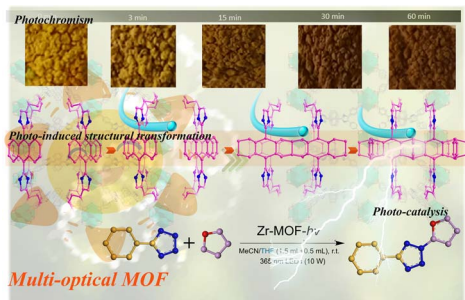
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### Achieving a dendrite-free Zn anode at high current densities *via in situ* polymeric interface design

Zhipei Zhong, Wenhao Ren and Suqing Wang\*

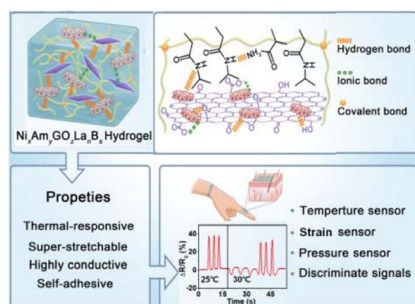
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### Enhancing energy transfer through visible-light-driven polymerization in a metal–organic framework

Yuan Chen, Ao-Gang Liu, Peng-Da Liu, Zi-Tong Chen, Shi-Yu Liu and Bao Li\*

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### Thermosensitive hydrogel-based, high performance flexible sensors for multi-functional e-skins

Dongdong Lu, Mingning Zhu, Xiaoyuan Li, Zilong Zhu, Xin Lin, Chuan Fei Guo\* and Xiaodong Xiang\*

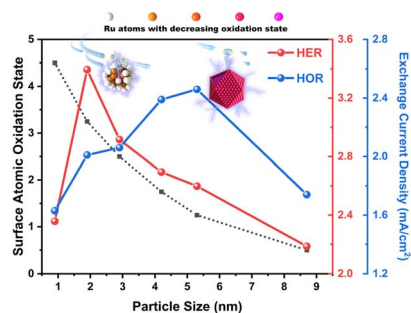




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### Fine-tuning surface oxidation states of ruthenium nanoparticles to enhance hydrogen electrode reactions

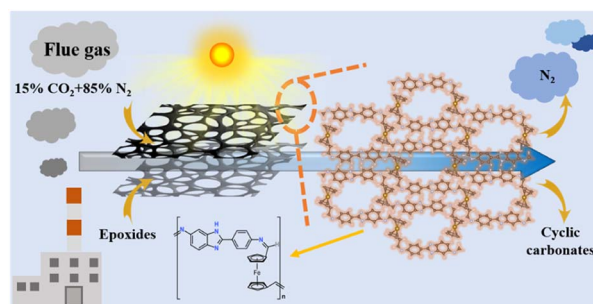
Hao Zhao, Jiejie Li, Jian Zou, Yangchun Tan, Chi Chen, Bo Yang, Qingqing Cheng\* and Hui Yang\*



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### A CO<sub>2</sub>-philic ferrocene-based porous organic polymer for solar-driven CO<sub>2</sub> conversion from flue gas

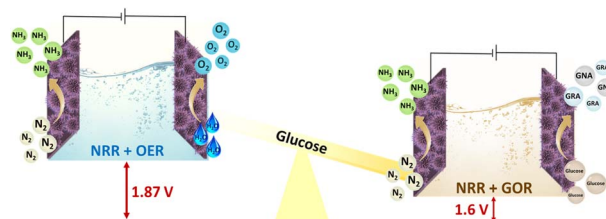
Zhou Fang, Yuqi Wang, Yue Hu, Bing Yao, Zhizhen Ye and Xinsheng Peng\*



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### Glucose oxidation assisted ammonia production via electrochemical dinitrogen reduction over CoWO<sub>4</sub>

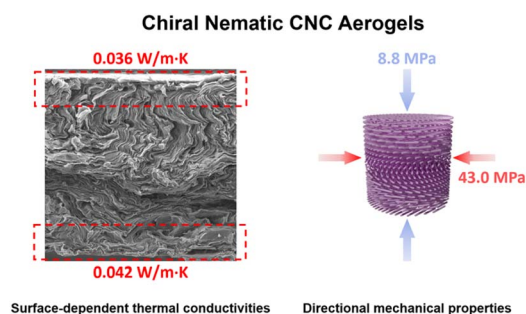
Akansha Chaturvedi, Divyani Gupta, Sukhjit Kaur, Kalpana Garg and Tharamani C. Nagaiah\*



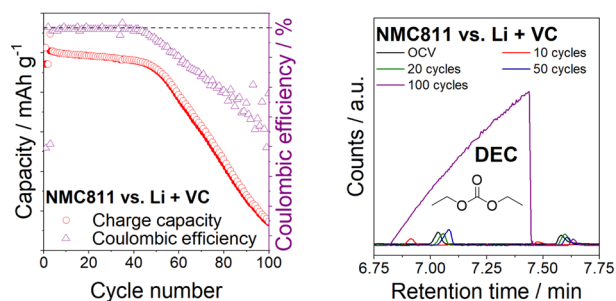
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### Exploring the anisotropic properties of chiral nematic cellulose nanocrystal aerogels: outstanding directional mechanical strength and unexpected surface-dependent thermal conductivity

Zongzhe Li, Karl Tsang, Yi-Tao Xu, James G. Drummond, D. Mark Martinez and Mark J. MacLachlan\*



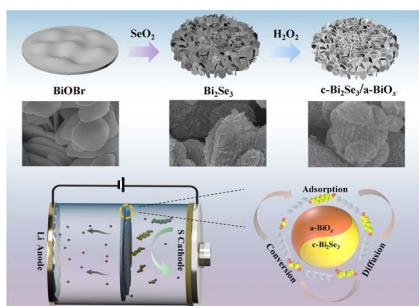
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### Understanding the limits of Li-NMC811 half-cells

Rory C. McNulty, Elizabeth Hampson, Lewis N. Cutler, Clare P. Grey, Wesley M. Dose and Lee R. Johnson\*

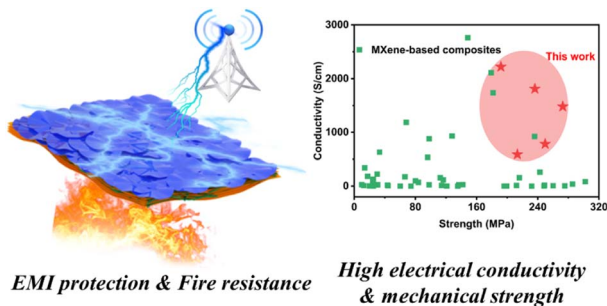
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### Amorphous/crystalline heterostructure design enables highly efficient adsorption–diffusion–conversion of polysulfides for lithium–sulfur batteries

Xiangpeng Wu, Zewei Shen, Daoping Cai,\* Ban Fei, Mincai Zhao, Junjie Fu, Qidi Chen and Hongbing Zhan\*

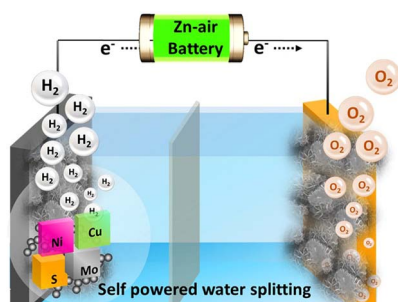
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### Fireproof ultrastrong all-natural cellulose nanofiber/montmorillonite-supported MXene nanocomposites with electromagnetic interference shielding and thermal management multifunctional applications

Rui Cheng, Ying Wu, Bin Wang,\* Jinsong Zeng, Jinpeng Li,\* Jun Xu, Wenhua Gao and Kefu Chen

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### A NiCu–MoS<sub>2</sub> electrocatalyst for pH-universal hydrogen evolution reaction and Zn–air batteries driven self-power water splitting

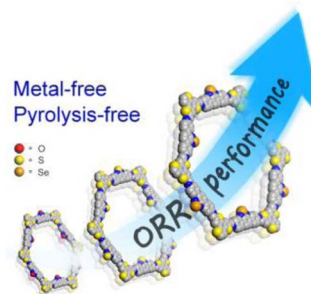
Mukesh Kumar and Tharamani C. Nagaiah\*



18349

### Metal-free covalent organic frameworks containing precise heteroatoms for electrocatalytic oxygen reduction reaction

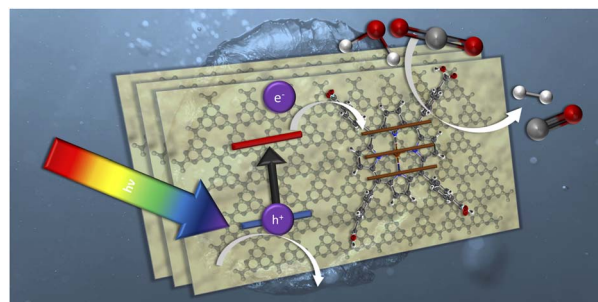
Jiali Li, Ji Jia, Jinqun Suo, Cuiyan Li, Zhiwei Wang, Hui Li,\*  
Valentin Valtchev, Shilun Qiu, Xiaoming Liu\*  
and Qianrong Fang\*



18356

### Band structure engineering of carbon nitride hybrid photocatalysts for CO<sub>2</sub> reduction in aqueous solutions

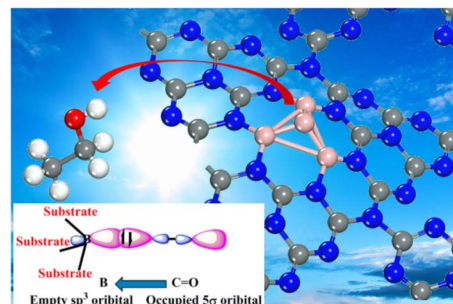
Verity L. Piercy, Gaia Neri, Troy D. Manning,  
Andrea Pugliese, Frédéric Blanc, Robert G. Palgrave,  
Alexander J. Cowan and Matthew J. Rosseinsky\*



18365

### Metal-free B<sub>4</sub>@g-C<sub>3</sub>N<sub>4</sub>: a potential electrocatalyst for highly selective and efficient conversion of CO to ethanol

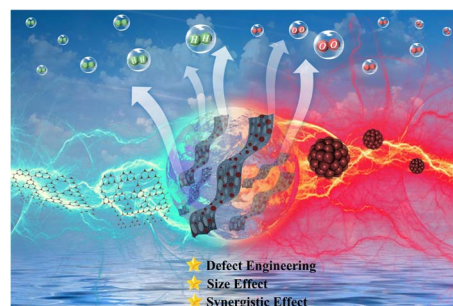
Zhichao Hao, Li-Juan Ma,\* Jianfeng Jia and Hai-Shun Wu



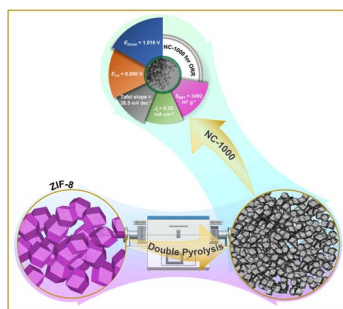
18375

### Anchoring Ru nanoclusters to defect-rich polymeric carbon nitride as a bifunctional electrocatalyst for highly efficient overall water splitting

Jiayang Zhao, Haoran Guo, Yanyan Li, Lirong Zheng,  
Hao Ren, Liyun Zhao and Rui Song\*



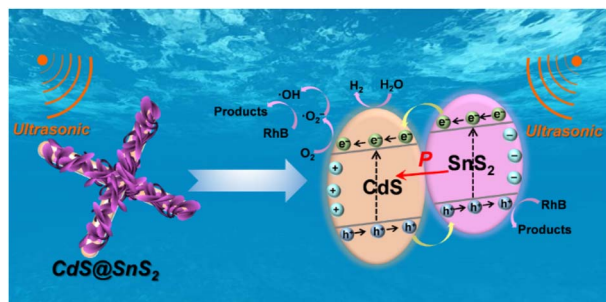
18387



### Boosting the oxygen reduction reaction using high surface area graphitic-N dominant nitrogen doped carbon

Rizwan Haider, Shengqi Ding, Wenrui Wei, Yi Wan, Yu Huang, Renhuan Li,<sup>\*</sup> Liang Wu, Ayaz Muzammil, Yi Fan and Xianxia Yuan<sup>\*</sup>

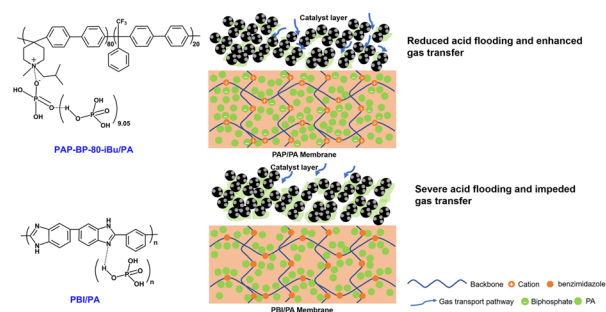
18398



### A novel 1D/2D core/shell CdS@SnS<sub>2</sub> heterostructure for efficient piezocatalytic hydrogen evolution and pollutant degradation

Renzhi Xiong, Yanjie Song, Kunjiao Li, Yanhe Xiao, Baochang Cheng and Shuijin Lei<sup>\*</sup>

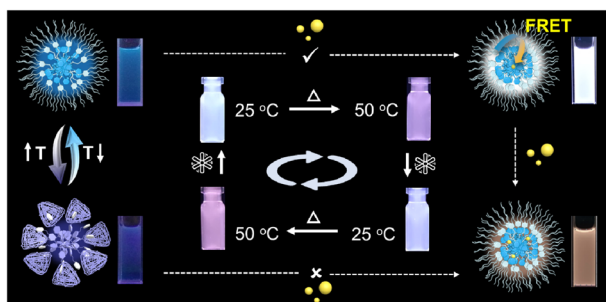
18409



### Alkyl-substituted poly(arylene piperidinium) membranes enhancing the performance of high-temperature polymer electrolyte membrane fuel cells

Jinyuan Li, Congrong Yang, Xiaoming Zhang, Zhangxun Xia, Suli Wang,<sup>\*</sup> Shansheng Yu and Gongquan Sun<sup>\*</sup>

18419



### A temperature-responsive artificial light-harvesting system in water with tunable white-light emission

Tangxin Xiao,<sup>\*</sup> Dongxing Ren, Lu Tang, Zhiying Wu, Qi Wang, Zheng-Yi Li and Xiao-Qiang Sun

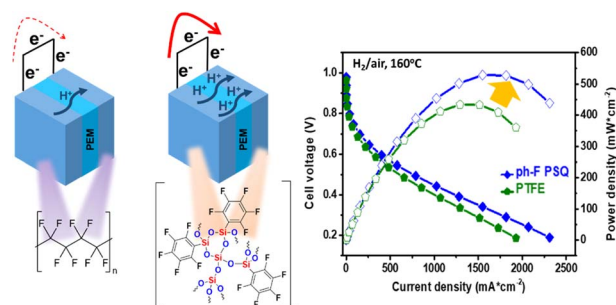




18426

### Mitigating phosphoric acid migration in high temperature polymer electrolyte membrane fuel cells with hydrophobic polysilsesquioxane-based binders

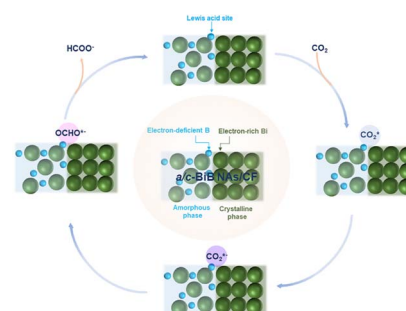
Dong-Yeop Yoo, Jiyeon Jung, Young Sang Park, Gwan Hyun Choi, Ho Gyu Yoon, Seung Sang Hwang and Albert S. Lee\*



18434

### Controlled boron incorporation tuned two-phase interfaces and Lewis acid sites in bismuth nanosheets for driving CO<sub>2</sub> electroreduction to formate

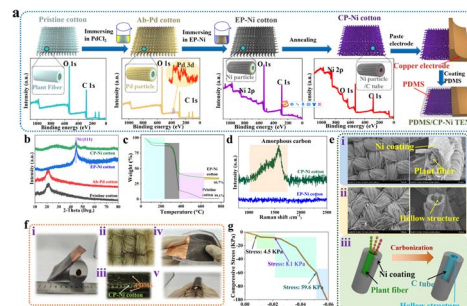
You Xu, Yiyi Guo, Youwei Sheng, Qingsong Zhou, Hongjie Yu, Kai Deng, Ziqiang Wang, Hongjing Wang\* and Liang Wang\*



18441

### Fabrication of triboelectric nanogenerators with multiple strain mechanisms for high-accuracy material and gesture recognition

Junjun Huang, Wenqing Zhang, Xin Chen, Sanlong Wang, Zhenming Chen, Peng Li,\* Honglin Li\* and Chengmei Gui\*



18454

### Correction: Large-scalable, ultrastable thin films for electromagnetic interference shielding

Jae Seo Park, Ji Yong Park, Kyunbae Lee, Young Shik Cho, Hyunji Shin, Yeonsu Jung, Chong Rae Park, Taehoon Kim,\* Jae Ho Kim\* and Seung Jae Yang\*



## CORRECTIONS

18455

**Correction: Constructing a rhenium complex supported on g-C<sub>3</sub>N<sub>4</sub> for efficient visible-light-driven photoreduction of CO<sub>2</sub> to CO via a novel Z-scheme heterojunction**

Phuong Ngoc Nguyen, Trang Thanh Tran, Quynh Anh Thi Nguyen, Yoshiyuki Kawazoe, S. V. Prabhakar Vattikuti, Long V. Le, Viet Quoc Bui,\* Tuan Manh Nguyen\* and Nam Nguyen Dang

