

# Journal of Materials Chemistry A

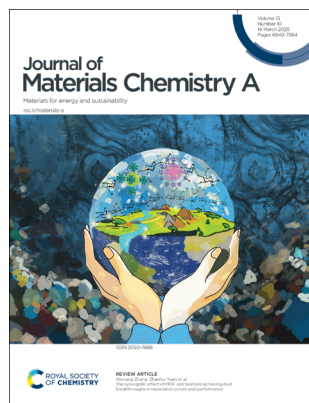
Materials for energy and sustainability

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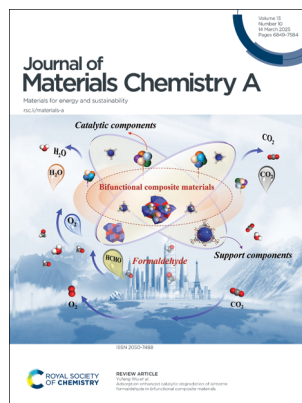
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## IN THIS ISSUE

ISSN 2050-7488 CODEN JMCAET 13(10) 6849–7584 (2025)



**Cover**  
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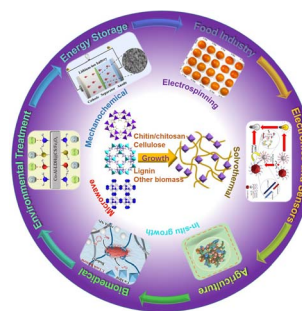
**Inside cover**  
See Yufeng Wu *et al.*, pp. 6895–6918. Image reproduced by permission of Xiao-Min Liu from *J. Mater. Chem. A*, 2025, **13**, 6895.

## REVIEWS

6866

### The synergistic effect of MOF and biomass achieving dual breakthroughs in material structure and performance

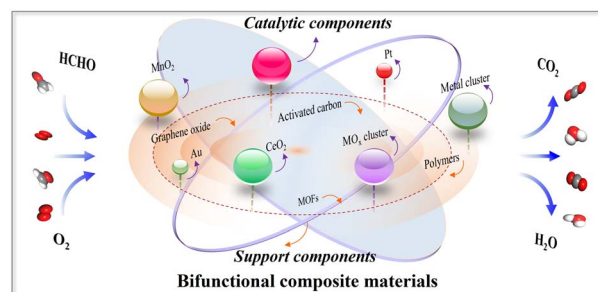
Ran Li, Xian Wang, Chengwei Lin, Xinxiang Zhang\* and Zhanhui Yuan\*



6895

### Adsorption enhanced catalytic degradation of airborne formaldehyde in bifunctional composite materials

Xiaomin Liu, Wenjing Miao, Linhua Xie, Bin Li and Yufeng Wu\*



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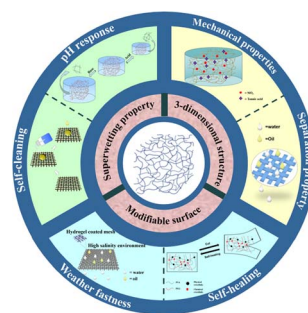


**SAVE  
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6919

## Hydrogels: a review on their versatile applications for efficient and stable oil–water separation

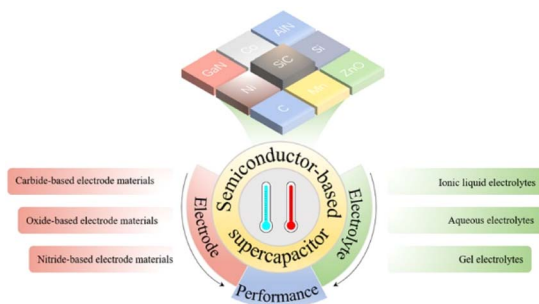
Yuxuan He, Jinxia Huang,\* Zhiguang Guo\* and Weimin Liu



6954

## Novel semiconductor materials for advanced wide temperature range supercapacitors

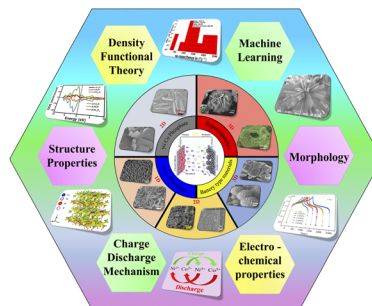
Lin Xu, Defu Sun, Songyang Lv, Ge Tian,\* Guodong Wang, Benfa Wang, Lei Zhang\* and Shouzhi Wang\*



6993

## Nickel cobalt phosphate/phosphide as a promising electrode material for extrinsic supercapacitors: machine learning analysis

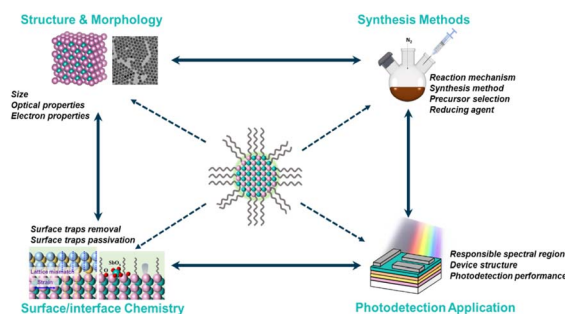
C. D. Chavare, D. S. Sawant, S. V. Gaikwad, A. V. Fulari, H. R. Kulkarni, D. P. Dubal\* and G. M. Lohar\*



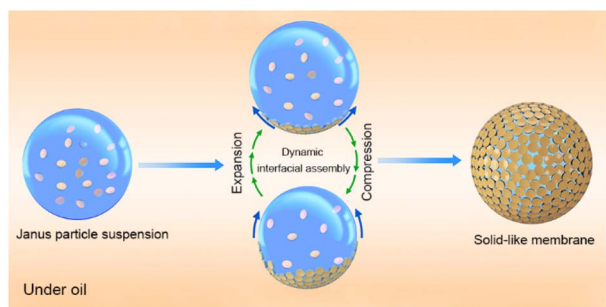
7055

## Advances in defect modulation strategies of indium antimonide semiconductor colloidal quantum dots for infrared photodetection

Yixiao Huang, Qinggang Hou, Jiahua Kong, Keke Wang, Linjun Huang, Zhonglin Du\* and Jianguo Tang\*



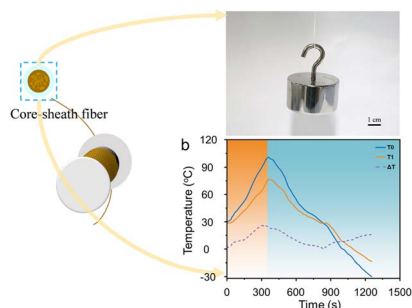
7073



### Structured droplets dominated by interfacial self-assembly of topology-tunable Janus particles towards macroscopic materials

Wenzhong Zhai, Xubo Liu, Jiajia Zhou, Qi Yu, Miao Liu, Jingxin Meng, Lu Zhang, Jun-Bing Fan\* and Shutao Wang\*

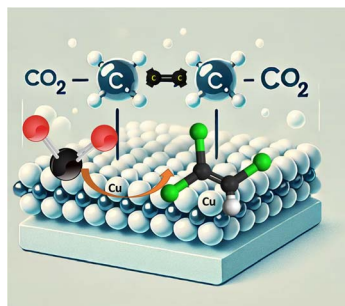
7081



### Fabrication of graphene oxide/silk protein core-sheath aerogel fibers for thermal management

Wenjing Xu, Chencheng Ren, Zhe Wang, Bimlesh Lochab, Jian Liu,\* Yuanyuan Zhang\* and Limin Wu

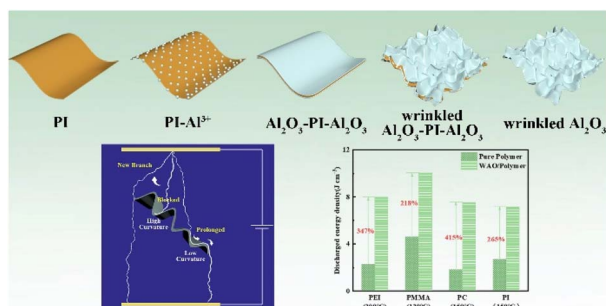
7091



### Geminal-Cu catalysts drive efficient C–C coupling to boost ethylene production via electrochemical CO<sub>2</sub> reduction

Hisham G. El-Aqapa, Ghada E. Khedr, Ibrahim M. Badawy, Ahmed M. Agour, Abdelrahman M. Abdelmohsen and Nageh K. Allam\*

7096



### Pinning and elongating of electric treeing induced by wrinkled nanosheets in polymer dielectrics towards significantly enhanced high-temperature energy storage performance

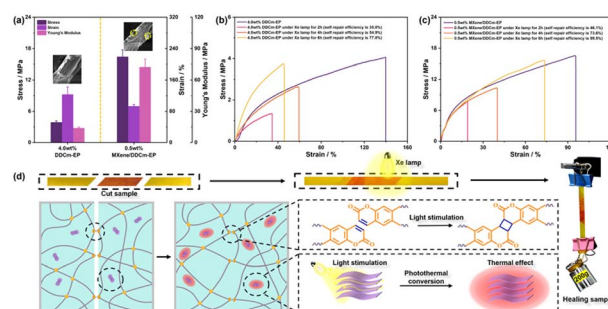
Xuyuan Fan, Linwei Zhu, Zelong Chang, Qingyang Tang, Davoud Dastan, Runhua Fan and Zhicheng Shi\*



7108

### Self-healing epoxy resin film enabled by the synergetic effect of coumarin and MXene

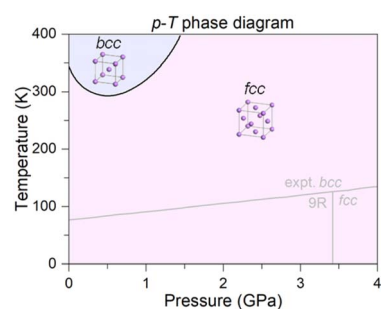
Bingrui Shi, Kaiming Yang, Yifeng Zhang, Feifei Wang, Wenyan Liu, Yekun Zhang and Hongxia Yan\*



7119

### Decoding lithium's subtle phase stability with a machine learning force field

Yiheng Shen and Wei Xie\*

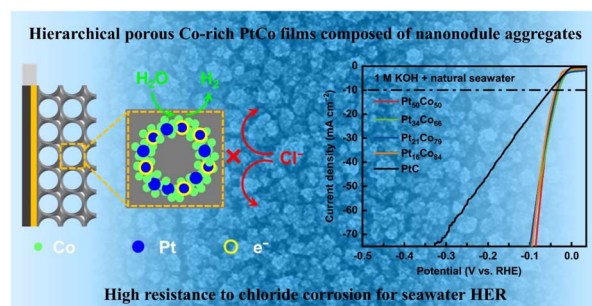


## PAPERS

7125

### Hierarchical porous Co-rich PtCo thin films for alkaline seawater hydrogen evolution with chlorine corrosion resistance

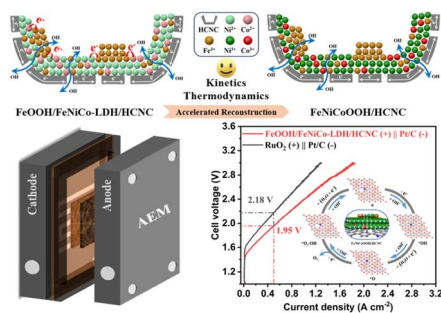
Meilin Zhang, Hanzhong Cui, Zhou Yang, Jie Yan, Jin Zhang,\* Huan Ma and Renguo Guan\*



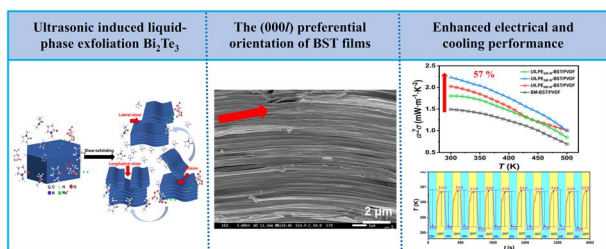
7136

### Collaborative reconstruction of FeOOH/FeNiCo-LDH heterogeneous nanosheets for enhancing anion exchange membrane seawater electrolysis

Yixing Luo, Yang Yang, Yakun Tian, Qingsheng Wu, Wen-Feng Lin and Ming Wen\*



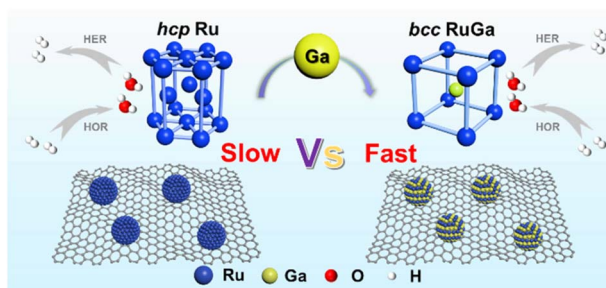
7149



### Ultrasonically induced liquid-phase exfoliation boosts excellent performance of $\text{Bi}_{0.5}\text{Sb}_{1.5}\text{Te}_3/\text{PVDF}$ thermoelectric films

Haotian Li, Shaoqiu Ke, Xiaoxiao Yu, Haojun Zhang, Xinyang Zhang, Xiaolei Nie,\* Wanting Zhu, Ping Wei,\* Wenyu Zhao and Qingjie Zhang

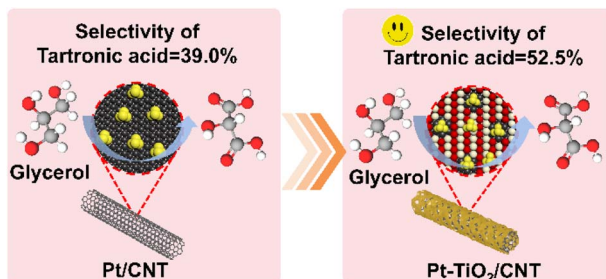
7158



### Unconventional-phase engineering of RuGa intermetallics for boosting alkaline hydrogen-electrode reactions

Chang Yang, Lulu An, Zhensheng Mi, Guangzhe Wang, Chenhao Zhang, Weijie Kong, Junhao Yang, Li Xiao, Lin Zhuang and Deli Wang\*

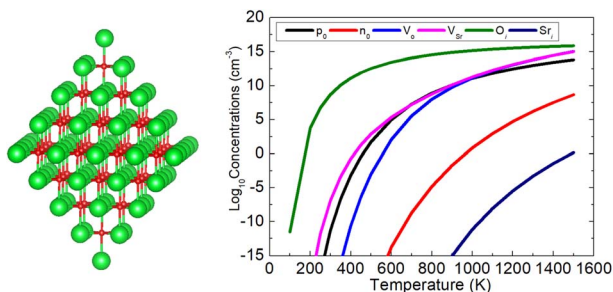
7168



### Pt nanoparticles supported on porous sheath $\text{TiO}_2$ wrapped carbon nanotubes for selective glycerol electro-oxidation into tartronate

Chaohui Guan, Jiefei Li, Tao Chen, Liang Lv, Junfeng Du, Shuai Zhang, Hang Wei and Haibin Chu\*

7176



### Origins of intrinsic p-type conductivity, p-n transition and substoichiometry in SrO

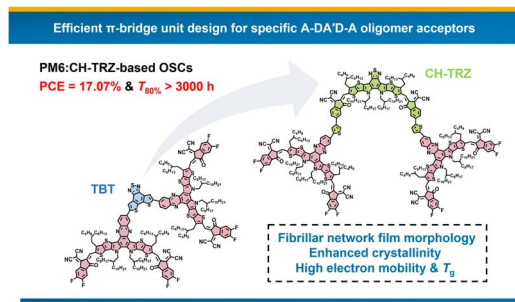
Taifeng Liu,\* Xingfan Zhang, Jingcheng Guan, Xuebo Chen,\* You Lu, Thomas W. Keal, John Buckeridge, C. Richard A. Catlow and Alexey A. Sokol\*



7187

## Effect of $\pi$ -bridge lengths in oligomerized fused-ring electron acceptors on the photovoltaic performance of organic solar cells

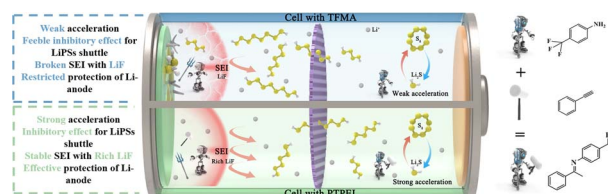
Mingxin Sun, Jianxiao Wang, Cheng Sun,\* Bin Tang, Xiaofei Qu,\* Shuguang Wen and Xichang Bao\*



7196

## Fluorinated imine modulating efficient sulfur redox kinetics and a stable solid electrolyte interphase in lithium–sulfur batteries

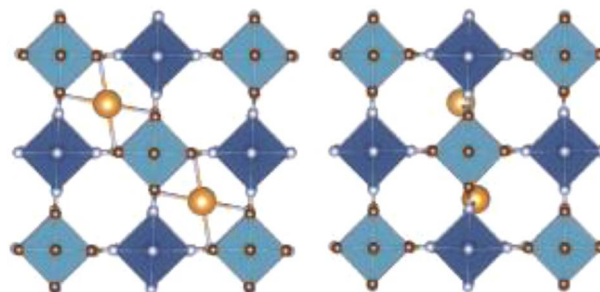
Tong Wu,\* Mingxun Jia, Ye Lu, Jinting Ye, Daotong Yang, Yingying Zhang, Shuyuan Xie, Dawei Kang, Limei Duan, Haiming Xie\* and Jinghai Liu\*



7207

## Structural evolution of Prussian blue analogues $A_xMFe(CN)_6$ upon intercalation of Na and K

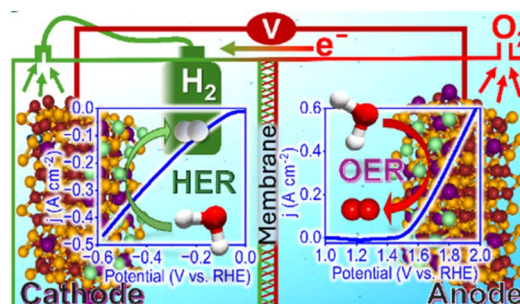
Mingrui Li and Furio Corà\*



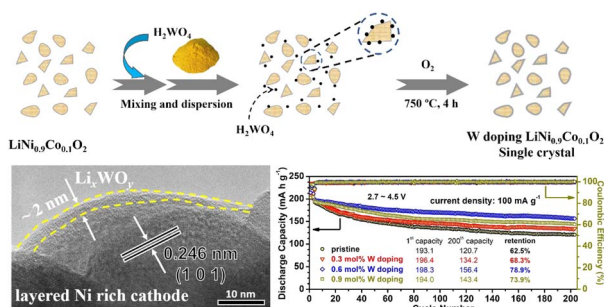
7215

## Synergistically enhanced electronic modulation in trimetallic Cu–Co–Mo-based heterostructured nanomaterials for green $H_2$ production via efficient alkaline electrolysis

Apurba Borah, Pooja, Ravinder Pawar and Gaddam Rajeshkhanna\*



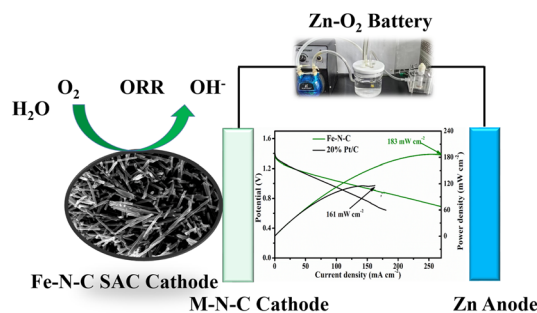
7228



### Tungsten doping reinforced structural stability of single-crystal nickel-rich $\text{LiNi}_{0.9}\text{Co}_{0.1}\text{O}_2$ cathodes

Zhen Xiao,\* Anqi Chen, Ruojian Ma, Yongquan Zheng, Xiao-Dong Qi, Yu-Jie Guo,\* Ruyi Fang, Yongping Gan, Xinpeng He, Xiaoxiao Lu, Jianping Xu, Hui Huang, Jun Zhang, Xinhui Xia, Wenkui Zhang, Sen Xin\* and Yang Xia\*

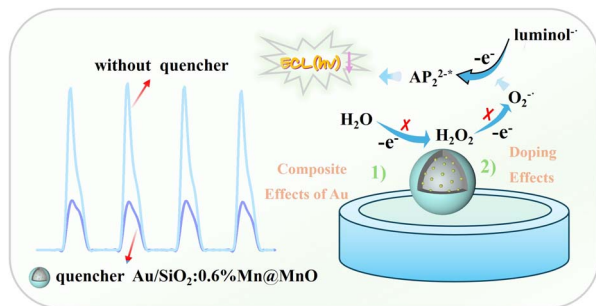
7237



### Single-atom catalyst with a hollow rod/plate-like structure for enhanced oxygen reduction reaction performance in zinc-air batteries

Muhammad Arif Khan, Guopu Cai, Rida Javed, Daixin Ye,\* Hongbin Zhao\* and Jiujuan Zhang

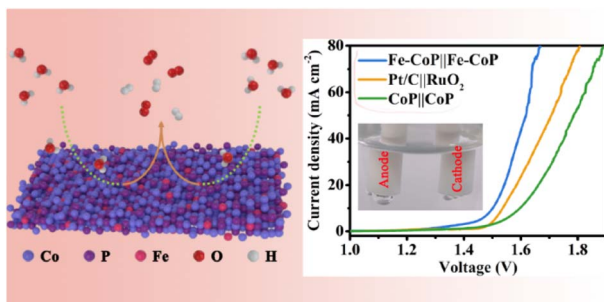
7249



### Modulation of electron transfer in electrochemiluminescence: synergistic utilization of doping effects in the material and composite effects of Au in the core-shell structure

Shaopeng Zhang, Mingzhe Jiang, Hongling Li, Wenjin Liang, Wenjing Lai, Haoyi Ren, Chenglin Hong\* and Weihua Xu\*

7263



### Exquisite restructuring of the electronic structure of cobalt phosphide via rationally controlling iron induction for water splitting under industrial conditions

Ziting Li, Peng Zhou, Mingyan Zhang, Haochen Zhang, Yongyi Zhang, Dan Han and Xiaoshuang Chen\*



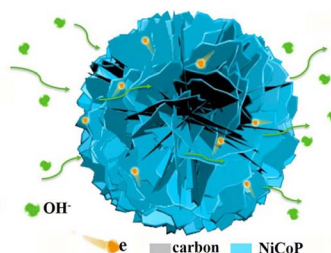
7274

### 3D NiCoP flowers assembled by 2D carbon-coated nanosheets as an efficient and stable positive electrode for supercapacitors

Xiaomeng Zhang, Xiaofeng Zhao, Buhe Bateer, Yanqing Jiao, Aiping Wu, Haijing Yan, Dongxu Wang, Jiaming Wang and Chungui Tian\*

#### Assembled 3D structure

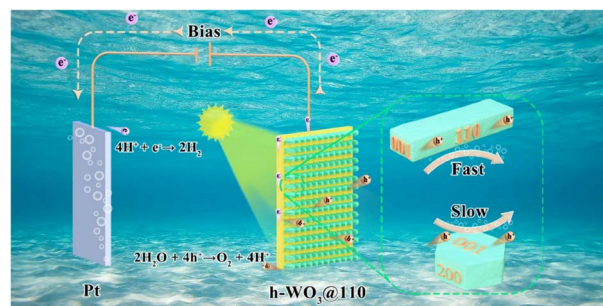
- Better withstands volume changes
- Stronger anti-aggregation ability
- Increased electrolyte penetration
- High effective specific surface area
- Abundant ion diffusion pathways



7284

### Controlling crystallographic orientation in h-WO<sub>3</sub> films to maximize photoelectrochemical water splitting efficiency

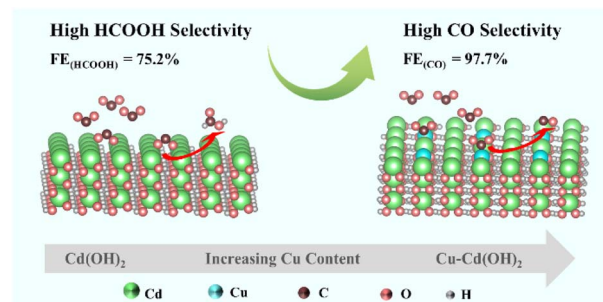
Wenhao He, Wenzhang Li, Jianye Liu, Ge Lou, Chenyu Zhang, Yang Liu\* and Jie Li\*



7295

### Switching between HCOOH and CO in electrochemical CO<sub>2</sub> reduction by doping Cu into Cd(OH)<sub>2</sub> catalysts

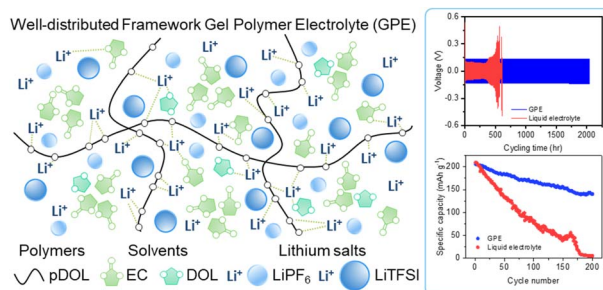
Mi Long, Xian Liu, Mingda Wang, Minxing Shu, Wenzhe Shan\* and Hongming Wang\*



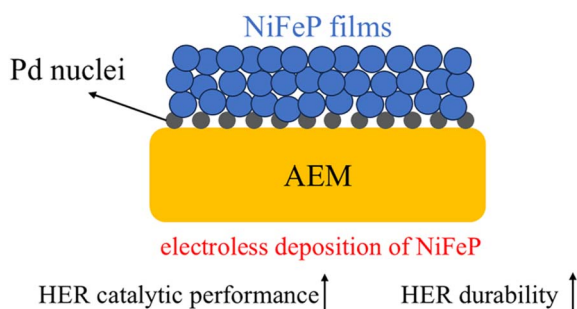
7302

### In situ polymerization of an electrochemically stable dual-salt gel polymer electrolyte for lithium ion batteries

Yen-Shen Kuo, Jhang-Yao Hong, Wei-Lung Chou\* and Yi-Hung Liu\*



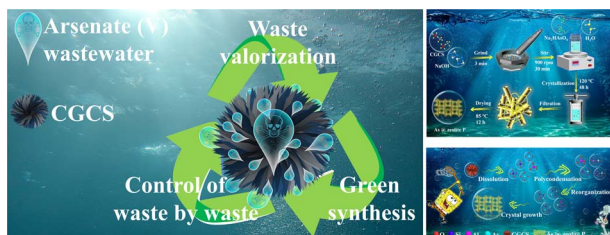
7313



### Electroless-deposited NiFeP catalyst-coated-membrane cathodes for anion exchange membrane water electrolysis

Kaiming Guo, Masahiro Kunimoto and Takayuki Homma\*

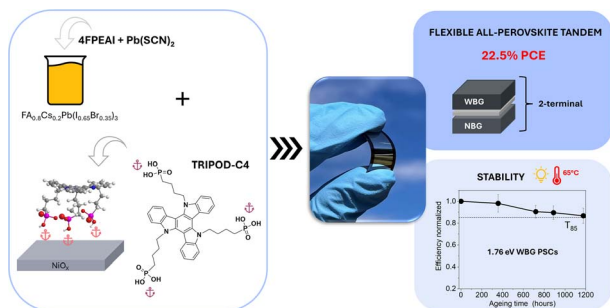
7324



### Lattice-trapping synthesis enhances fixation of As(v) in As@zeolite P

Lu Ma, Yu Li, Qi Wang, Ning Feng, Ruyang Wang, Mei Yang, Qian Ma, Yuanyuan Li, Yulong Ma, Yonggang Sun, Xiaoxia Ma and Wenxin Ji\*

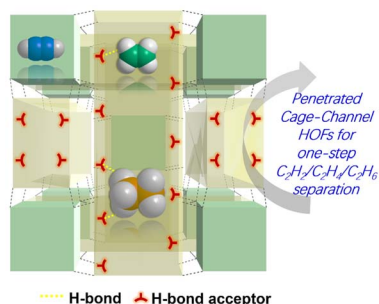
7335



### Compositional and interfacial engineering for improved light stability of flexible wide-bandgap perovskite solar cells

Anna Wąsiak-Maciejak, Łukasz Przypis, Wiktor Żuraw, Kinga Rycek, Patrycja Janicka, Mateusz Ścigaj, Konrad Dyk, Huagui Lai, Adrianna Piejko, Damian Pucicki, Fan Fu, Vasył Kinzhybalo and Konrad Wojciechowski\*

7347



### Scalable reflux synthesis of a bimicroporous hydrogen-bonded framework with specific molecule recognition ability for one-step ethylene purification

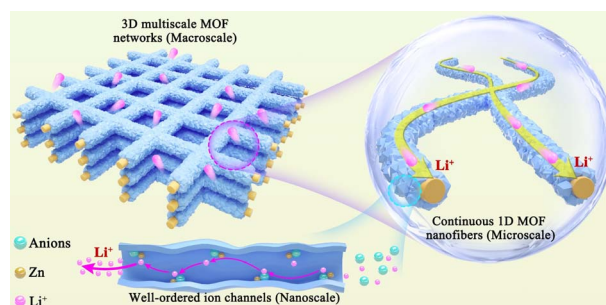
Jiao Lei, Wenyu Yuan, Ying-Ying Xue, Libo Li, Tianhao Lan, Yan-Fei Li, Zhang-Lei Zhong and Quan-Guo Zhai\*



7357

## A thermomechanically stable nanofiber separator with multiscale MOF networks towards high-efficiency ion transport

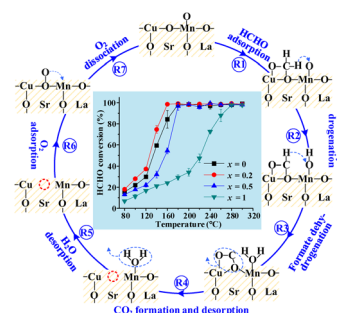
Feifei Lan, Huijuan Zhao,\* Yu Jiang, Cancan Jin, Guodong Zhao\* and Lin Li\*



7371

## Unraveling the role of a Cu dopant in formaldehyde catalytic oxidation over a La<sub>0.8</sub>Sr<sub>0.2</sub>Mn<sub>1-x</sub>Cu<sub>x</sub>O<sub>3</sub> perovskite: an experimental and theoretical study

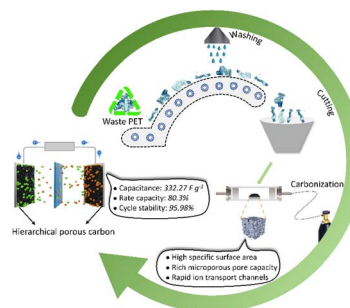
Junyan Ding, Liming Zhao, Yingju Yang and Jing Liu\*



7381

## Converting waste poly(ethylene terephthalate) into hierarchical porous carbon towards a high-performance supercapacitor

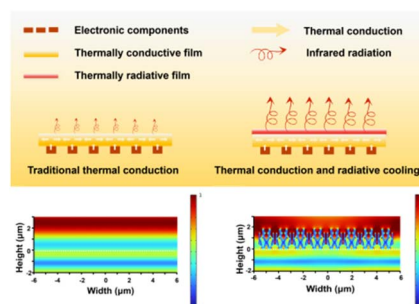
Kaile Wang, Ruiyang Li, Xuesen Zeng, Pingan Song,\* Jisheng Sun and Rongjun Song\*



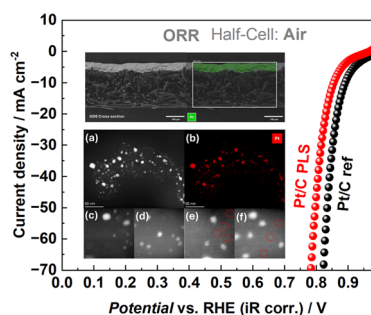
7392

## Asymmetric structure endows thermal radiation and heat conduction in graphene films for enhancing dual-mode heat dissipation

Ruo-Han Niu, Ye-Wen Li, Shi-Long Ma, Zong-Lin Yi, Li-Jing Xie, Fang-Yuan Su, Hui Jia\* and Cheng-Meng Chen\*



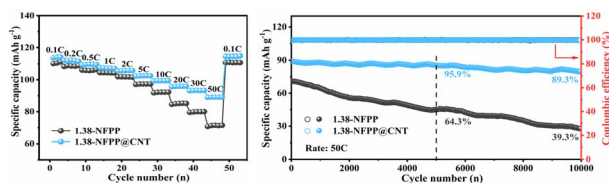
7403



### Print-light-synthesis of electrocatalytically active gas diffusion electrodes for fuel cell applications

Wanderson O. Silva,\* Alexandre Mabillard, Mathieu Soutrenon, Grégoire Gschwend, Yorick Ligen, Steve Joris, Luc Bondaz, Kumar Varoon Agrawal and Hubert H. Girault

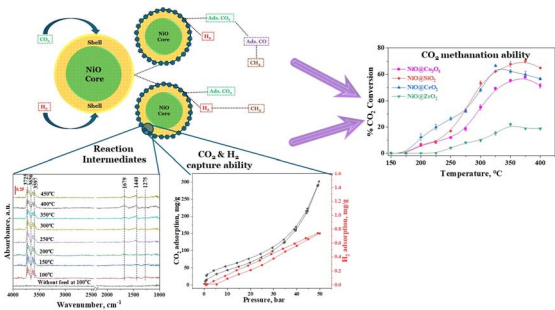
7413



### Preparation and application of the high-performance sodium-ion battery cathode material $\text{Na}_{3.6}\text{Fe}_{2.6}(\text{PO}_4)_{1.6}\text{P}_2\text{O}_7$ @CNT with dual-carbon coating

Binghan Dai, Tianming Lu, Jinhan Teng, Junjie Huang, Enmin Li, Kaibo Zhang, Qiang Wang, Dongdong Yin, Sicheng Liu, Luyu Lei, Xin Tang\* and Jing Li\*

7422

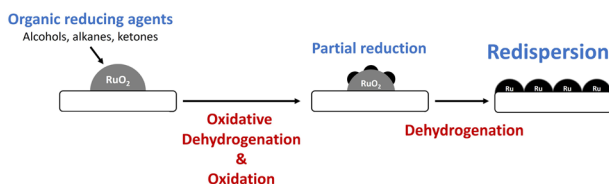


### Unraveling the $\text{CO}_2$ methanation and capture ability of $\text{NiO}$ @metal oxides

Huldah Suharika Chitturi, Yalagandula Lavanya, Yaddanapudi Varun, Anurag Ramesh, Sri Himaja Pamu, I. Sreedhar and Satyapaul A. Singh\*

7445

### $\text{RuO}_2$ reduction by organic compounds



### Reduction of $\text{RuO}_2$ nanoparticles supported on silica by organic molecules: a strategy for nanoparticle redispersion

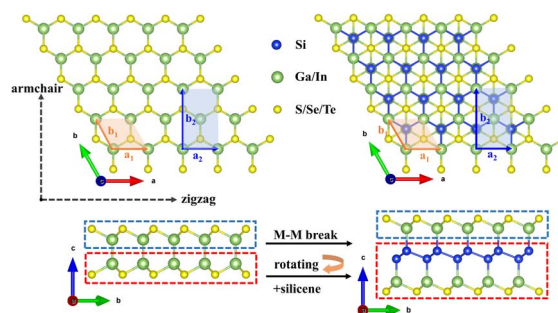
Gabriel Fraga, Muxina Konarova, Laurence Massin, Athukoralalage Don K. Deshan, Darryn Rackemann, Bronwyn Laycock, Steven Pratt and Nuno Batalha\*



7461

### Single-layer group III-IV-VI semiconductors: potential photocatalysts for water splitting with high carrier mobilities

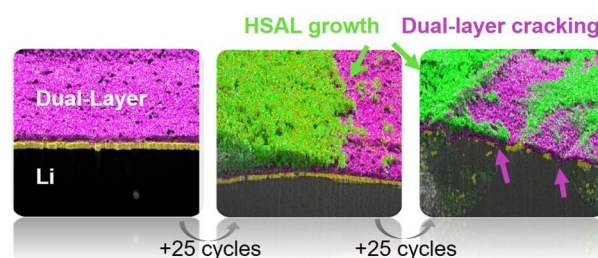
Qiu Yang, Qi-Dong Hao, Cui-E Hu,\* Hua-Yun Geng and Xiang-Rong Chen



7476

### Dual protective layer on lithium metal anodes for improved electrochemical performance – in-depth morphological characterization

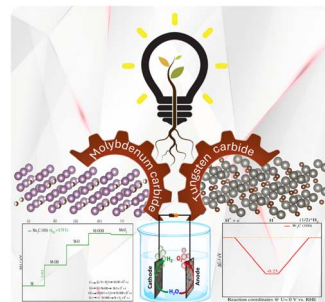
Marlena M. Bela, Maximilian Mense, Sebastian Greiwe, Marian C. Stan, Simon Wiemers-Meyer, Martin Winter and Markus Börner\*



7488

### Exploring structural and electronic properties of transition metal carbides (T = Ti, V, Mo, & W) as efficient catalysts for overall water splitting with the DFT study

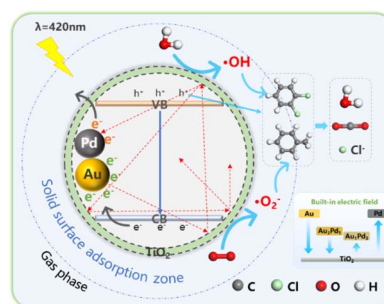
Tata Sanjay Kanna Sharma, Jayasmita Jana, Beena Mol Babu, Mohamed A. Ghanem, K. C. Bhamu, K. S. S. V. Prasad Reddy, Kuo-Yuan Hwa, Sung Gu Kang, Jin Suk Chung, Seung Hyun Hur\* and Won Mook Choi\*



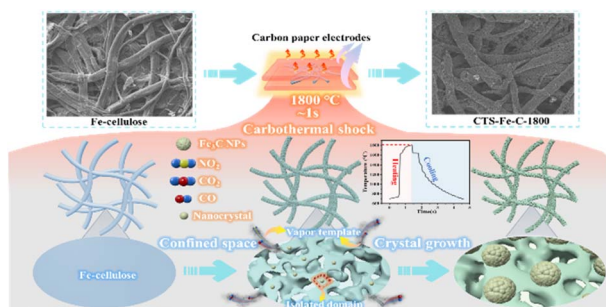
7503

### Enhancing photocatalytic activity through the manipulation of intrinsic electric fields in yolk-shell hollow AuPd@TiO<sub>2</sub> structures

Shan Jiang, Yihang Zhang, Yunyang Wang, Yanrong Zhang, Yong Chen, Jiakuan Yang, Yoon-Seok Chang, Ericson Escobedo and Jianyu Gong\*



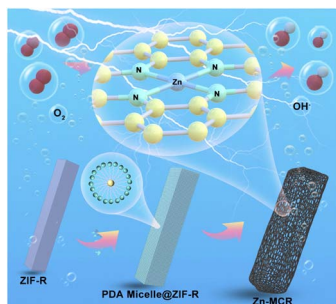
7515



### Ultrafast synthesis of porous Fe<sub>3</sub>C/carbon hybrid materials via a carbothermal shock reactor for advanced energy storage applications

Jun Cao, Kai-Yue Ji, Ming-He Du, Chi Zhang, Qi Sun, Ying Yi, Ze-Fan Chai, Chun-Jie Yan and Heng Deng\*

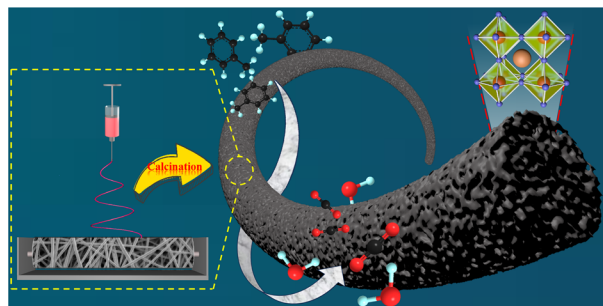
7529



### Single Zn atoms anchored in mesoporous N-doped carbon rods derived from metal–organic frameworks for enhanced electrocatalytic oxygen reduction reaction

Mengxue Ma, Zhuoya Pei, Yuxin Peng, Rong Hua, Yuxing Ma, Weilong Wang, Xiaoxiang Xu,\* Xuepeng Zhang and Haoquan Zheng\*

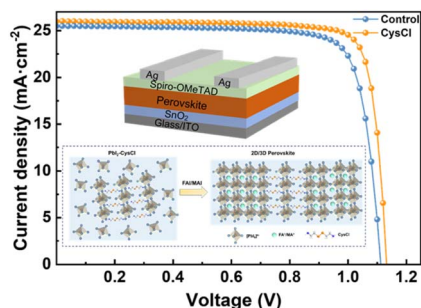
7539



### Engineering surface-exposed LaCoO<sub>3</sub> perovskite nanotubular catalysts for catalytic combustion of toluene through acid etching

Shixing Wu, Zhan Shi, Fang Dong, Xin Song, Weiliang Han,\* Weigao Han, Haitao Zhang, Xiuyan Dong and Zhicheng Tang\*

7554



### Controlled crystal orientation and reduced lattice distortion with a cystamine dihydrochloride spacer for efficient and stable 2D/3D perovskite solar cells

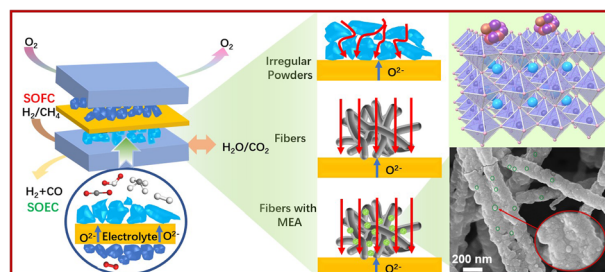
Shunhui Liu, Xueying Wang, Yang Zhong,\* Xiao Luo, Yikun Liu, Binlou Gao, Licheng Tan\* and Yiwang Chen\*



7563

### Exsolved medium-entropy alloy FeCoCuNi in titanate fibers enables solid oxide cells with superb electrochemical performance

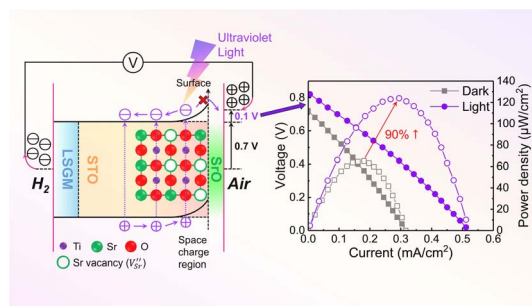
Zilin Zhou, Jiajia Cui,\* Zhengrong Liu, Jiaming Yang, Yueyue Sun, Chaofan Yin, Zixuan Xue, Jiayi Niu, Jingze Liu, Kai Wu\* and Jun Zhou\*



7573

### Modulation of the photo-response of SrTiO<sub>3</sub>: influence of surface defects on solid oxide photoelectrochemical cells

Luyao Wang, Jifang Zhang, Xinyu Zhang, Guijun Ma\* and Nan Yang\*



7582

### Correction: Enhancing the thermoelectric figure of merit of BiN via polymorphism, pressure, and nanostructuring

Elena R. Remesal, Victor Posligua, Miguel Mahillo-Paniagua, Konstantin Glazyrin, Javier Fdez. Sanz, Antonio M. Márquez and Jose J. Plata\*

