

# Journal of Materials Chemistry A

Materials for energy and sustainability

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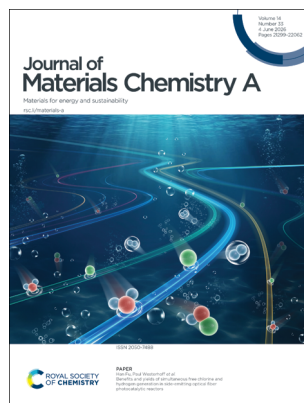
## IN THIS ISSUE

ISSN 2050-7488 CODEN JMCAET 14(33) 21299–22062 (2026)



### Cover

See Bo Weng, Pedro H. C. Camargo, Wenyi Huo *et al.*, pp. 21316–21341. Image reproduced by permission of Wenyi Huo from *J. Mater. Chem. A*, 2026, 14, 21316.



### Inside cover

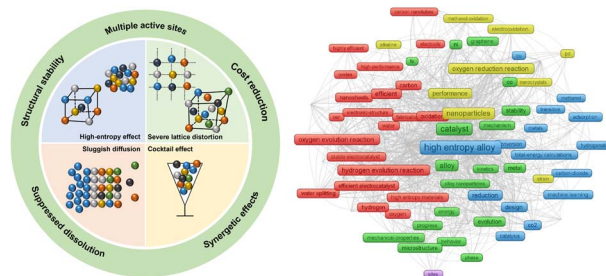
See Han Fu, Paul Westerhoff *et al.*, pp. 21492–21506. Image reproduced by permission of Han Fu from *J. Mater. Chem. A*, 2026, 14, 21492.

## REVIEWS

21316

### High-entropy alloy electrocatalysts for oxygen reduction and hydrogen evolution reactions: recent advances and future perspectives

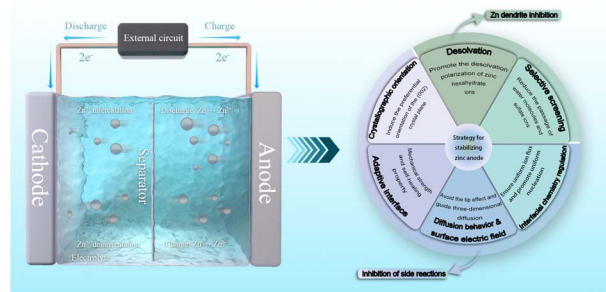
Peichen Wang, Shiqi Wang, Łukasz Kurpaska, Haixian Yan, Silvia Bonfanti, Bo Weng,\* Pedro H. C. Camargo\* and Wenyi Huo\*



21342

### Advancing aqueous zinc-ion batteries through polymer interface engineering: from mechanisms to applications

Zhengmin Zhong, Zhouxiao Wang, Lisan Fu, Pengze Yang, Jinkai Liu and Qiliang Pan\*



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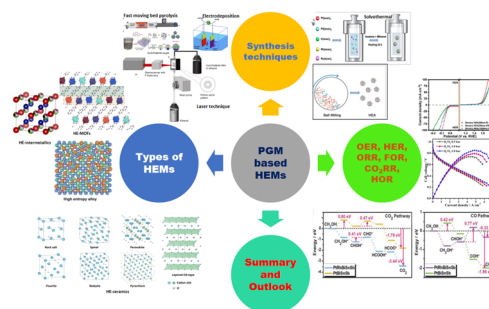
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## REVIEWS

21365

## Platinum-group-metal high-entropy materials: emerging electrocatalysts for sustainable energy conversion

Rebekah Aruldas and Grzegorz D. Sulka\*



21428

## Advances in perovskite/C<sub>60</sub> interface engineering for efficiency and stability in perovskite/silicon tandem solar cells

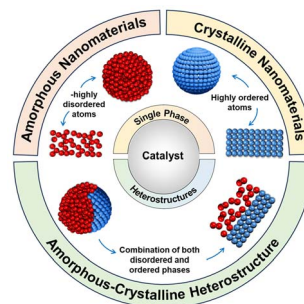
Dawei Duan, Fei Wang, Qiannan Li, Xiaokang Sun, Annie Ng,\* Qidong Tai\* and Hanlin Hu\*



21447

## Why do amorphous–crystalline heterostructures excel in the urea oxidation reaction over single phases?

Shamsa Kizhepat, Girum Getachew Demissie, Abhishek P. Salunkhe, Subrahmanya T. M., Wubshet Mekonnen Girma, Chiranjeevi Korupalli, Rutuja A. Chavan, Anil V. Ghule, Jia-Yaw Chang\* and Akash S. Rasal\*

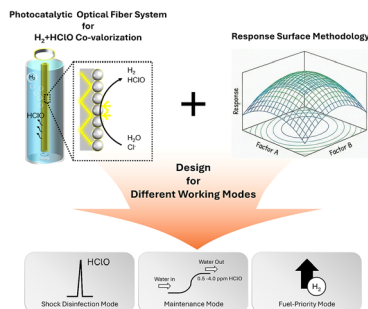


## PAPERS

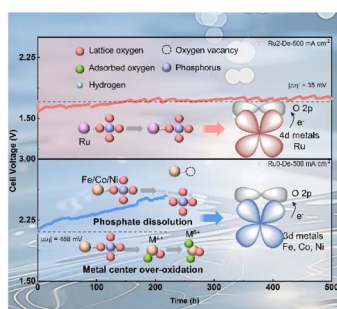
21492

## Benefits and yields of simultaneous free chlorine and hydrogen generation in side-emitting optical fiber photocatalytic reactors

Han Fu, Ethan Sheard, Jirapat Ananpattarachai, Daisuke Ioka, Zhenhua Pan and Paul Westerhoff\*



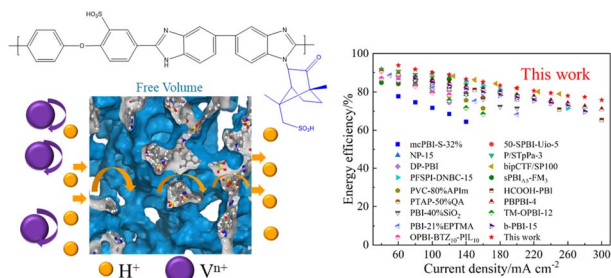
21507



### Orbital overlap-stabilized amorphous metal phosphate frameworks for industrial current density electrocatalysis

Jinyan Xie, Shiyu Yang, Ziyong Zhang, Fei Han, Ruizhe Ru, Lei Zhang, Zunming Lu, Guowei Li,<sup>\*</sup> Jun-Qiang Wang<sup>\*</sup> and Juntao Huo<sup>\*</sup>

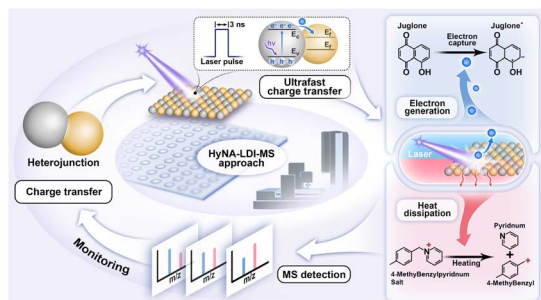
21517



### Building ion selective channels through bulky camphorsulfonic acid side chains in sulfonated polybenzimidazole membranes for vanadium redox flow batteries

Yujie Guo, Bo Pang,<sup>\*</sup> Fujun Cui, Tingxu Fang, Li Tian, Liu Yang, Zeyu Chen, Gaohong He and Xuemei Wu<sup>\*</sup>

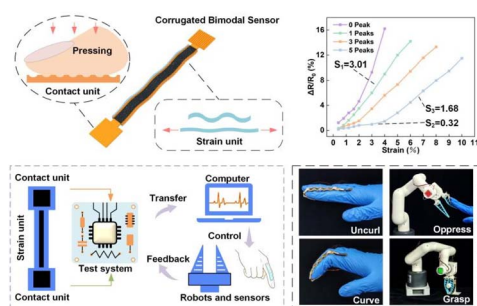
21526



### HyNA-LDI-MS: a real-time mass spectrometric approach for probing interfacial charge transfer

Yanyan Li, Yang Li, Dingyitai Liang, Shouzhi Yang, Zhiqiang Wang, Xueqing Gong,<sup>\*</sup> Yuning Wang<sup>\*</sup> and Kun Qian<sup>\*</sup>

21535



### Laser-induced graphene-based corrugated bimodal sensor for strain and contact monitoring in wearables and intelligent robotics

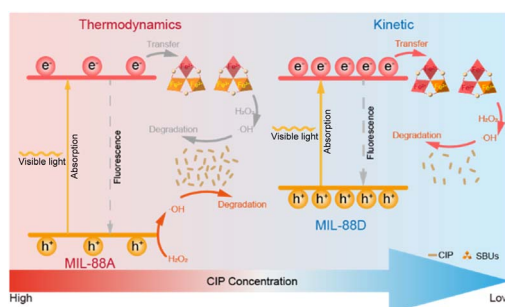
Weixiong Yang, Lingxue Ouyang, Yuhan Guo, Mingguang Han and Sida Luo<sup>\*</sup>



21546

### Ligand-length engineering in isoreticular Fe-MOFs enables efficient ciprofloxacin degradation

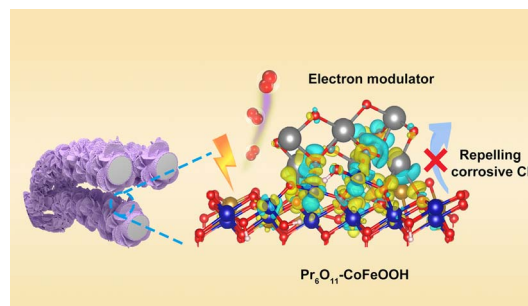
Hanqi Li, Xinyan Qiu, Shiyu Yuan, Yanyi Lu, Xiaoran Yan, Yuzheng Guo and Zhuo Jiang\*



21557

### Pr<sub>6</sub>O<sub>11</sub>-driven electron modulation via d–f orbital hybridization for alkaline seawater electrolysis

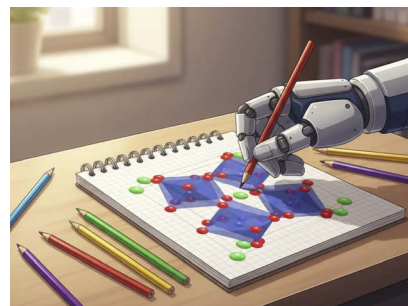
Nana Chen, Bari Wulan,\* Weipeng Zhang, Xinping Xie, Yuying Zhao, Haibin Guan, Dongxing Tan, Lei Chen, Baofeng Zhao and Weihong Zhou\*



21568

### Deep learning framework for accurate prediction and high-throughput search of the thermoelectric figure of merit in skutterudites

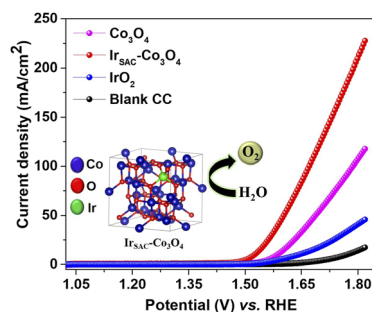
Victor Posligua,\* Karina Landivar, Elena R. Remesal, Gerda Rogl, Peter F. Rogl, Javier Fdez Sanz, Jesús Prado-Gonjal, Antonio M. Márquez and Jose J. Plata\*



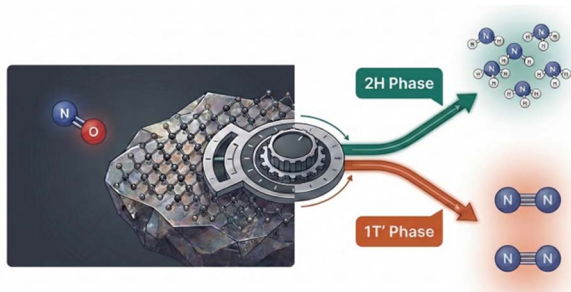
21582

### Enhanced activity and durability of Ir single-atom catalysts for the electrocatalytic oxygen evolution reactions through synergistic electronic coupling with Co<sub>3</sub>O<sub>4</sub> matrix

Astha Gupta, Swarup Ghosh, Dinesh Bhalothia,\* Joydeep Chowdhury and Surojit Pande\*



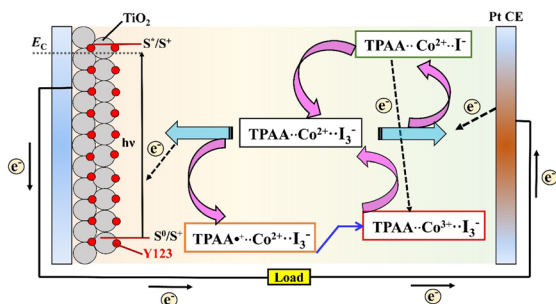
21598



### Tuning product selectivity in direct electroreduction of NO via phase engineering of MoS<sub>2</sub> nanosheets in a water-fed PEM electrolyzer

Min Li, Frank Hernandez Baena, Shota Matsuo, Mingliang Chen, Boaz Izelaar, Ruud Kortlever and Atsushi Urakawa\*

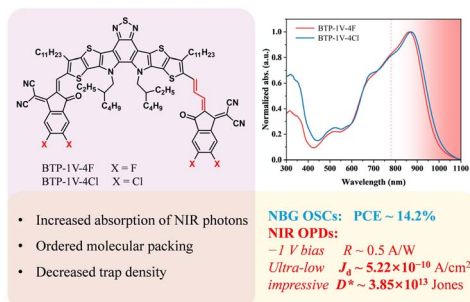
21607



### Advanced ternary ion-pair redox electrolytes for direct-contact dye-sensitized solar cells under one-sun and ambient lighting

Shanmuganathan Venkatesan, Hsiao-Ching Wang, Zi-Yan Liu, Hsin Chen, Hsisheng Teng and Yuh-Lang Lee\*

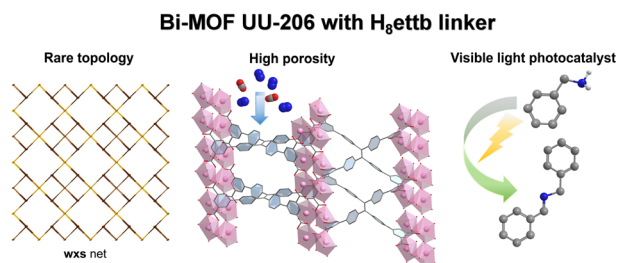
21623



### Designing narrow bandgap small-molecule acceptors with unilateral vinylene $\pi$ -bridge for high-performance optoelectronic devices

Shuangshuang Li, Tong Liu, Fuzhen Bi, Renqiang Shao, Hongquan Liu,\* Jianxiao Wang, Tan Wang, Shuguang Wen\* and Xichang Bao\*

21633



### A multifunctional bismuth-based metal-organic framework with record-high porosity, rare topology, and efficient visible light photocatalysis

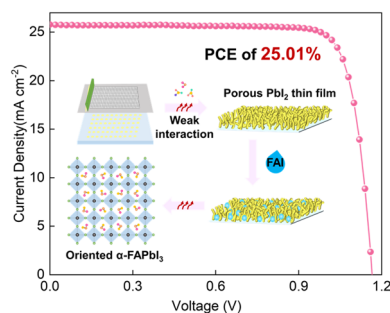
Michelle Åhlén, Ha Phan, Mariusz Kubus, James N. McPherson, Françoise M. Amombo Noa, Lars Öhrström, Kasper S. Pedersen, Maria Strømme and Ocean Cheung\*



21641

### Anion-competition regulation of $\text{PbI}_2$ frameworks for two-step fabricated perovskite solar cells

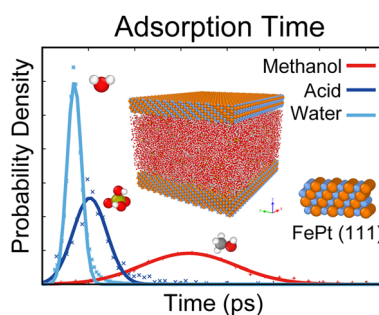
Qing Yao, Jianbing Zhu, Changshun Chen, Guang Yang, Zhenhuang Su, Tingting Niu, Tengfei Pan, Kui Xu, Yingdong Xia, Xingyu Gao, Lingfeng Chao\* and Yonghua Chen\*



21648

### Adsorption kinetics of small molecules on FePt metallic electrodes by classical molecular dynamics simulation

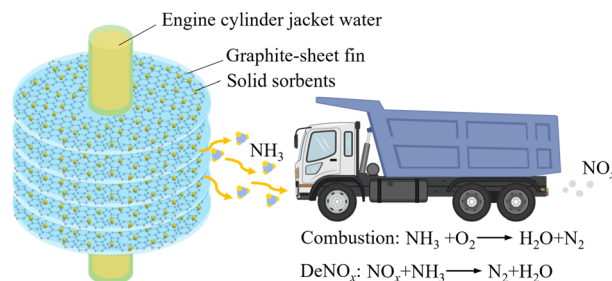
Fan Meng,\* Jialong Liu, Qiqi Mo and Noriyoshi Arai



21659

### Oriented, lightweight and compact graphite-sheet-fin-based solid ammonia carriers enabling risk-free, sustainable onboard ammonia energy supply

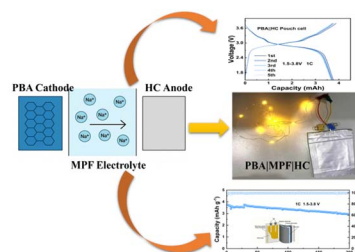
Peng Gao,\* Shikun Fu, Baoliang Zhang, Kedi Wang, Weidong Wu and Liwei Wang\*



21672

### Methyl propionate-dominant electrolyte for enhanced kinetics and low-temperature performance of Prussian blue analogue-based rechargeable sodium-ion batteries

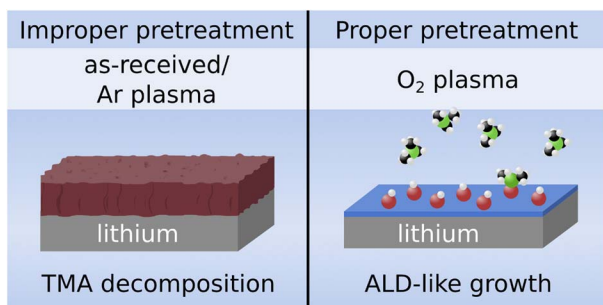
Qiancheng Du, Jiaqi Sun, Varun Kumar Singh, Dhinesh Subramanian, Yanbo Zhang, Huarong Zhang\* and Yang Zhang\*



PBA- Prussian Blue Analogue  
MPF- Methyl propionate-based electrolyte with 8% fluoroethylene carbonate  
HC- Hard Carbon



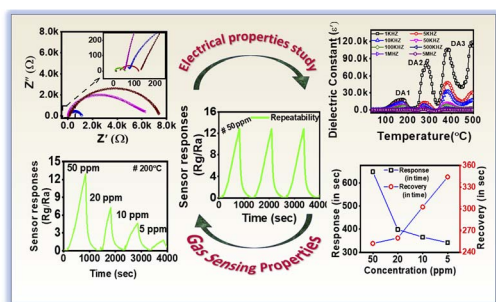
21682



### *In vacuo* XPS study: controlled ALD growth of Al<sub>2</sub>O<sub>3</sub> on metallic lithium enabled by plasma pretreatment

Tippi Verhelle, Lowie Henderick, Saeed Yari, Siebe Coessens, Matthias M. Minjauw, Louis De Taeye, Philippe M. Vereecken, Jolien Dendooven, Mohammadhosein Safari and Christophe Detavernier\*

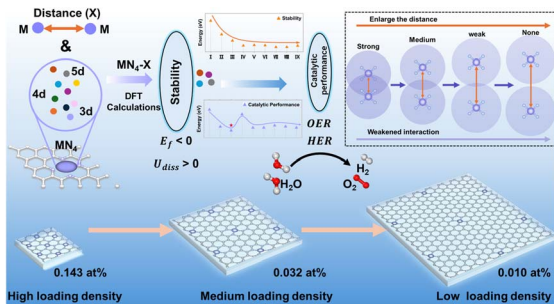
21695



### Charge transport mechanism in HfO<sub>2</sub>-modified ZnO composite for NO<sub>x</sub> gas sensing applications

Sharmistha Anwar, A. Sathiya Priya, Bibekananda Nayak, Sayan Dey and Shahid Anwar\*

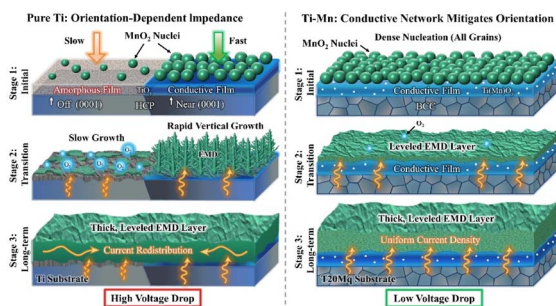
21711



### Inter-site coupling and nonlinear density-activity relationship in M-N-C single-atom catalysts

Xinqi Chen, Ran Shi, Haiyang Cheng, Tianci Huang, Tong Zhou, Qingju Liu and Tianwei He\*

21720



### Decoupling anodic passivation from electrodeposition: synergistic crystallographic and electronic modulation for energy-efficient EMD electrowinning

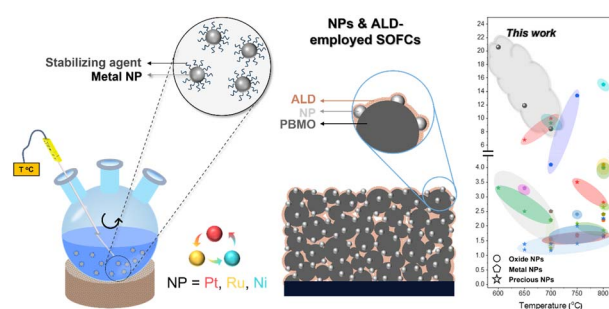
Luli Feng, Fengwei Xie, Ziyi Xu, Ziren Yuan, Linping Yu,\* Weijun Shen and Yuehui He\*



21733

## A degradation-free platform for intrinsic comparison of metal nanoparticles in methane-fueled SOFC anodes

Calem Duah, SungHyun Jeon, Raphael Edem Agbenyeke, Jongsu Seo, Chang Gyouon Kim, Young Kuk Lee, Seon Joo Lee\* and WooChul Jung\*



21743

## Natural biomass-based multifunctional conductive composite films integrating personal thermal management, electromagnetic interference shielding, and physiological signal sensing

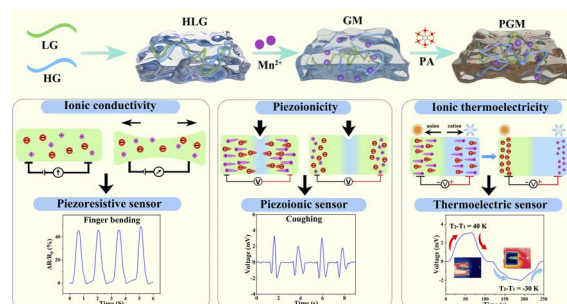
Songyu Han, Xugang Dang,\* Jiajia Tang and Xuechuan Wang



21760

## Gellan gum-based ionic conductive hydrogel with self-healing capability, piezoelectricity and ionic thermoelectricity as flexible sensors

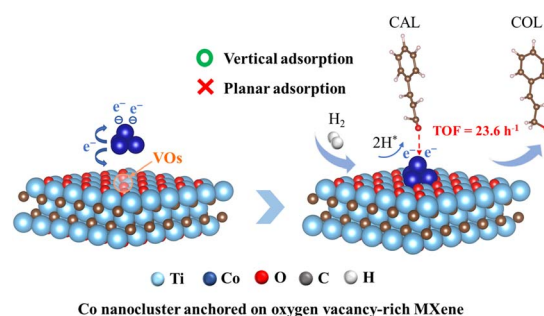
Zhitao Hu, Susu Ma, Yang Yang, Ruopeng Li, Kewei Du, Jie Wei,\* Yunfei Niu\* and Jun Zhao\*



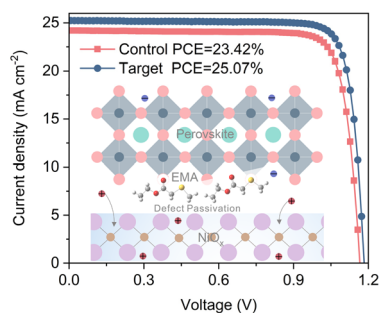
21776

## Vacancy-rich Ti<sub>3</sub>C<sub>2</sub>O<sub>x</sub> (MXene)-anchored Co nanocluster catalyst enhances the selective hydrogenation of cinnamaldehyde

Haixiang Shi, Jianming Xu, Liyun Chen, Tongming Su, Xinling Xie, Xuan Luo, Zuzeng Qin\* and Hongbing Ji



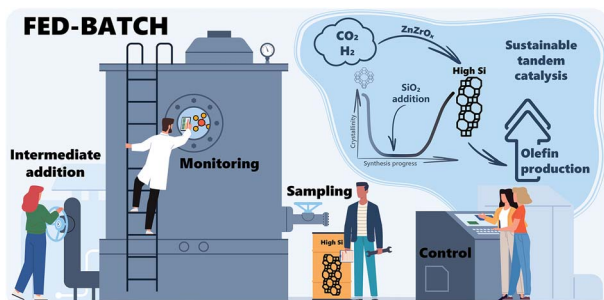
21790



### Improved buried interface contact in inverted perovskite solar cells with dual-site-binding molecules

Ying-Ying Zhang, Yong-Chun Ye,<sup>\*</sup> Jisen Zhang, Bing-Hao Lv, Liu-Jiang Zhang, Bi-Yun Shi, Qiao-Jun Cao, Qiu-Feng Ye, Xingyu Gao, Haipeng Xie, Tingting Shi<sup>\*</sup> and Wei-Dong Dou<sup>\*</sup>

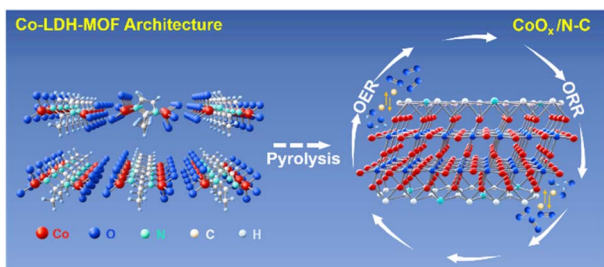
21799



### Reactor-based approach for achieving high-silica zeolites: a fed-batch strategy

Amirhossein Javdani, Gleb Ivanushkin, Ahmed Sajid, Iqtidar Ali Khan, Ibrahim Khalil, Paola Herrero, Quanli Ke, Aron Deneyer and Michiel Dusselier<sup>\*</sup>

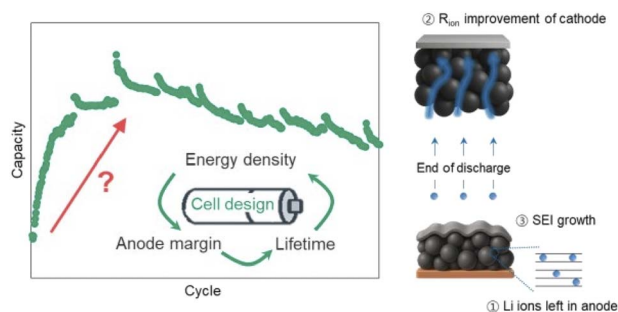
21814



### Structurally engineered bifunctional oxygen electrocatalysts derived from a cobalt-based LDH-MOF architecture

Jianwen Chen, Guangke Huang, Fan Yu, Bo Wang, Qing Shi, Qiliang Wei, Weiyu Yang, Chaoyi Chen<sup>\*</sup> and Qiao Liu<sup>\*</sup>

21826



### Origin of capacity rise in LiFePO<sub>4</sub> batteries: practical implications for reliable cell design

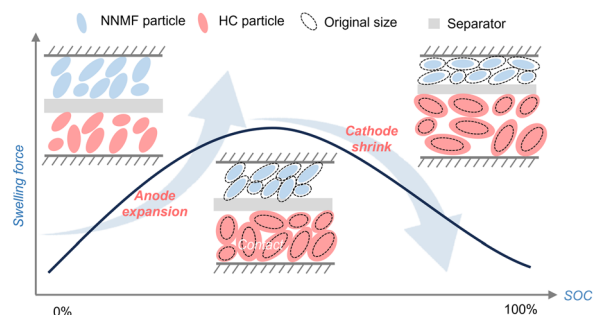
Minsoo Kim,<sup>\*</sup> Jinsu Ha, Moon-Seok Kwon, Bokhyun Ka, Sanghee Nam, Sunyhik Ahn, Soonsung Suh, Songyul Oh and Ayoung Kim



21836

### Electrochemo-mechanical coupled behaviors in sodium-ion batteries upon stack pressure

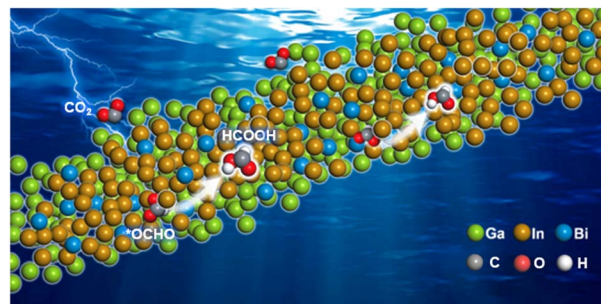
Bo Rui, Youngwon Hahn, Amit Bhowmick, Farzaneh Mousavi, Sandeep Kulathu, Victor Oancea and Jun Xu\*



21848

### Voltage-driven surface reconstruction of ternary liquid metals for enhanced electrocatalytic CO<sub>2</sub> conversion

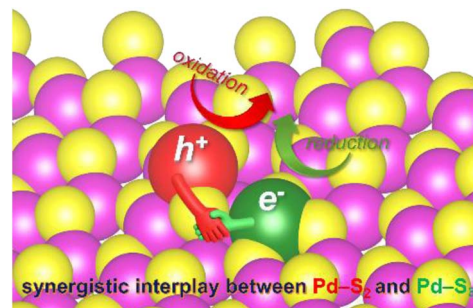
Chao Li, Siwen Guo, Mingjie Li,\* Zehui Lin, Deyu Wang, Dongming Liu, Jie Wang, Xingyun Li\* and Chaoxu Li\*



21859

### Directional electron and hole transfer driven by distinct Pd sites in CdS photocatalysts revealed by nonadiabatic dynamics simulations

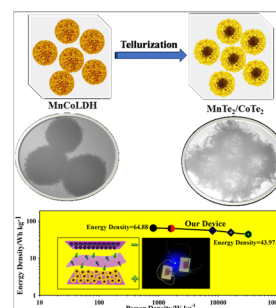
Xiao-Ying Xie,\* Ya-Qi Xu, Wei-Hai Fang and Ganglong Cui



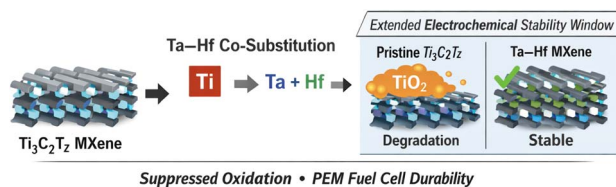
21866

### Hierarchical hollow MnTe<sub>2</sub>/CoTe<sub>2</sub> composite nanospheres assembled from porous nanosheets: synergistic structural engineering for high-performance hybrid supercapacitors

Akbar Mohammadi Zardkhoshoui,\* Erfan Behzadi, Mohammad Ali Saghafizadeh and Saied Saeed Hosseiny Davarani\*



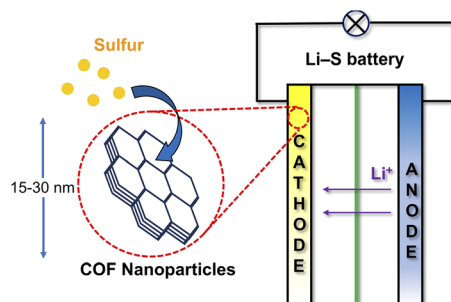
21885



## Extending the electrochemical stability window of $\text{Ti}_3\text{C}_2\text{T}_x$ MXenes via Ta-Hf co-substitution for durable proton exchange membrane fuel cell catalyst supports

Haridas Parse, Danielle Svirilily, Bar Favelukis, Mathias Krämer, Andrea M. Mingers, Sukanta Chakrabarty, Noam Eliaz, Baptiste Gault, Dierk Raabe, Maxim Sokol and Brian A. Rosen\*

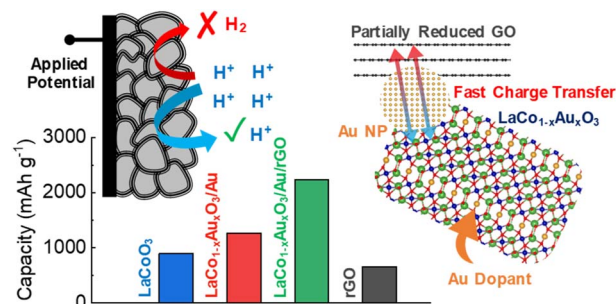
21900



## Synthesis of triazine-based covalent organic framework nanoparticles as cathode materials for lithium-sulfur batteries

Shixi Zhong, Li Du, Zhiming Cui, Shijun Liao\* and Wei Zeng\*

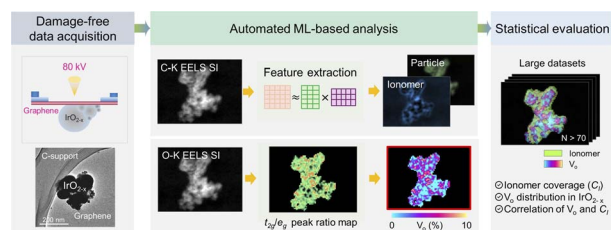
21911



## Gold-bridged $\text{LaCo}_{1-x}\text{Au}_x\text{O}_3$ perovskite nanocomposites for synergically enhanced electrochemical hydrogen storage

Maryam Ostadebrahim, Mohammad Qorbani,\* Amr Sabbah,\* Ying-Ren Lai,\* Mohammad Soleimani, Michitoshi Hayashi, Li-Chyong Chen, Kuei-Hsien Chen and Omran Moradlou\*

21927



## Machine-learning-driven integrated probing of oxygen-vacancy distribution and ionomer morphology in an iridium oxide catalyst-ionomer nanocomposite electrode for water electrolyzers

Yerin Jeon, Sang-Hyeok Yang, Hyeon-Ah Ju, Kwanhong Park, Wooseon Choi, Daehee Yang, Hakjoo Lee, Dami Lim, Shin Jang, Jaekwang Lee,\* Jae-Hyeok Kim\* and Young-Min Kim\*

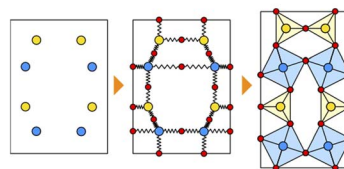


21940

## Discovery of oxide Li-conducting electrolytes with corner-sharing frameworks *via* topology-constrained crystal structure prediction

Seungwoo Hwang, Jiho Lee, Jisu Kim, Seungwu Han, Youngho Kang\* and Sungwoo Kang\*

Crystal structure prediction algorithm for corner-sharing (CS) frameworks



Screening

24,463

$$E_{\text{hull}} \leq 50 \text{ meV/atom}$$

438

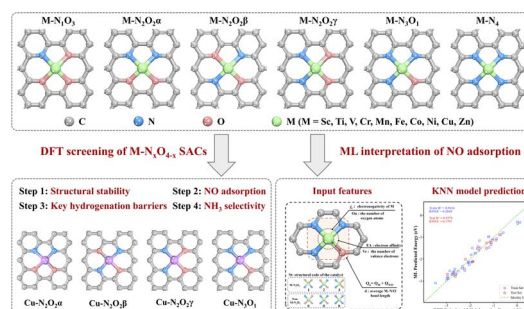
$$\sigma_{300\text{K}} \geq 0.1 \text{ mS/cm}$$

92 SSE candidates

21957

## Enhancing NO electroreduction on N/O coordinated single-atom catalysts *via* d-band center modulation

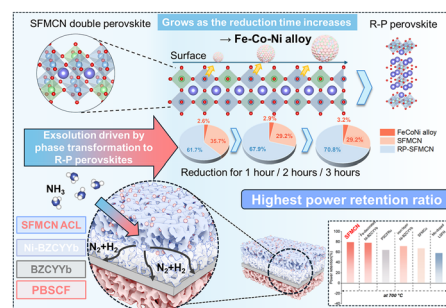
Shuigen Zhu, Hao Yuan, Yu Zhang, Guobing Zhou\* and Zhen Yang\*



21971

## Time-phase-controlled exsolution of FeCoNi ternary alloy nanoparticles on perovskite anode catalyst for enhanced dual-functional catalysis and protection in ammonia-fueled protonic ceramic fuel cells

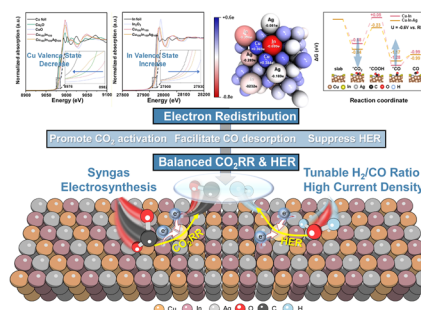
Xiaole Yu, Zenan Zhao, Bingyu He, Zhanheng Jin, Zhexiang Yu, Qing Ni, Sheng Cui and Lin Ge\*



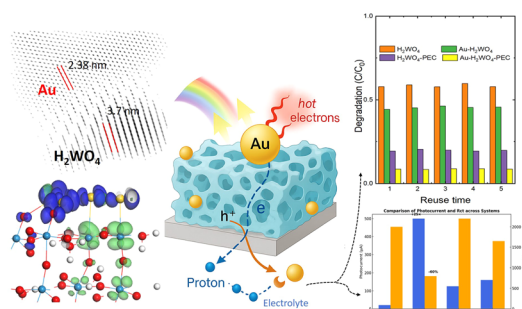
21986

## CO<sub>2</sub> electroreduction to ratio-tunable syngas with Cu–In–Ag electrodes: from electronic structure regulation to mechanistic understanding

Jingui Ma, Zean Liu, Xiaonan Liu, Mengxuan Kuang, Yuhong Lai, Feiyu Li, Yu Chen, Quan Shi, Yansheng Liu and Junwei Hou\*



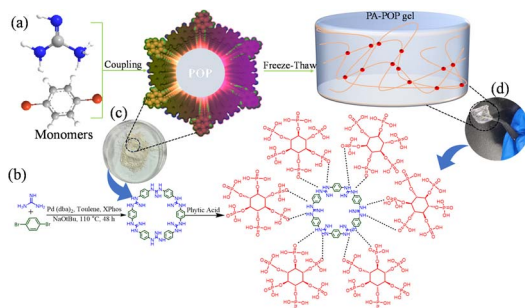
21998



### Interfacial electronic modulation in Au–tungstic acid for enhanced PEC performance

T. Anh Thu Do and Minh Tan Man\*

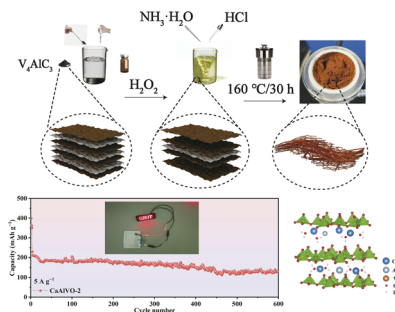
22008



### Flexible redox active porous organic polymer gels via noncovalent assembly for high energy supercapacitors

Suhail Ayoub Khan, Mutawara Mahmood Baig, Hamza Ahmad, Guoyin Zhu, Huan Pang\* and Yizhou Zhang\*

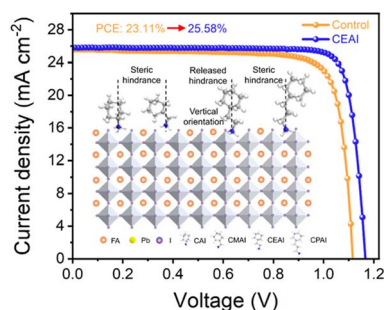
22019



### Dual-ion pre-intercalated vanadium oxides derived from $V_4AlC_3$ MAX via HF-free synthesis for aqueous zinc-ion batteries

Lejun Li, Zengrong Mao, Wenhai Xiao, Junling Xu, Xiaoyan Shi, Lianyi Shao,\* Zhipeng Sun,\* Chengcheng Chen\* and Lifeng Hang\*

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### Molecular orientation–steric hindrance tradeoff of cyclohexylammonium passivators for high-performance perovskite solar cells

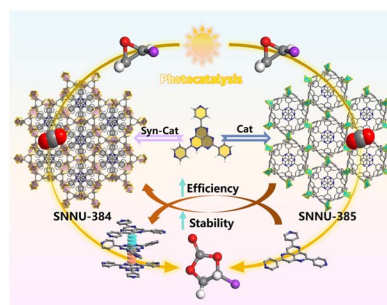
Shuang Gao, Zehuan Jia, Shantao Zhang, Xinyu Li, Dehan Li, Yue Zhang, Tianao Hou, Rongyao Lv, Zhimin Fang,\* Wenjing Chen, Tao Chen, Zhengguo Xiao, Junfa Zhu, Xiaojun Wu,\* Xu Pan\* and Shangfeng Yang\*



22040

## Hexaazaphenalene-based pore-space-partitioned metal–organic frameworks for enhanced CO<sub>2</sub> capture and photocatalytic fixation

Zi-Yuan Liu, Shu-Cong Fan, Jia-Wen Wang, Li-Qiu Yang, Chen-Chen Xing, Wen-Yu Yuan, Ying Wang, Shun-Fu Du and Quan-Guo Zhai\*



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## New MXene-derived anthracene-based metal–organic framework with controllable morphology for high-performance sensing

Nasrin Kabeer, Mostafa Zeama, Yusuf Khan, Hadeer Elsayed, Jehad K. El-Demellawi, Anita Justin, Vinayak S. Kale, Osama Shekhah, Omar F. Mohammed, Husam N. Alshareef\* and Mohamed Eddaoudi\*

