

# Journal of Materials Chemistry A

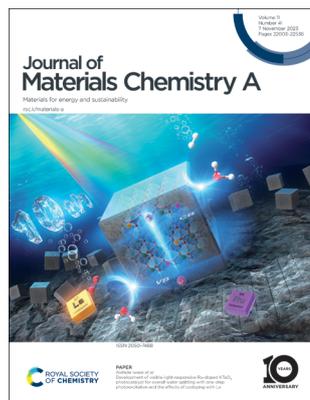
Materials for energy and sustainability

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## IN THIS ISSUE

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## EDITORIAL

22018

### *Journal of Materials Chemistry A* Editor's choice collection: Advancing electrocatalysts for a sustainable world

Subrata Kundu

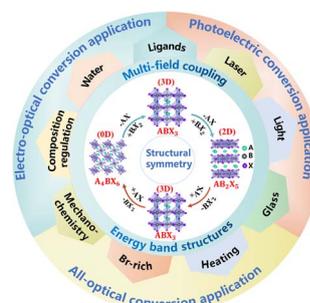


## REVIEWS

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### Phase engineering of inorganic halide Cs–Pb–Br perovskites for advanced energy conversion

Zhigang Yang, Shuqin Zhang, Tianqing Sheng, Xinran Lv, Xuguang Wei, Shengjian Qin, Shenghui Yi and Jinjin Zhao\*



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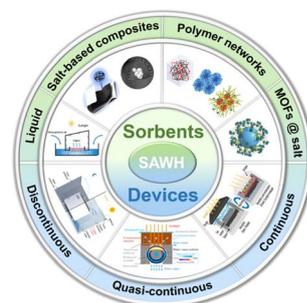


## REVIEWS

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**Atmospheric water extraction – a review from materials to devices**

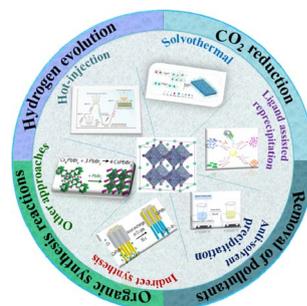
Chentian Zhang, Hanyu Guo, Chunmei Li, Fei Wang, Xinyue Guo, Ailin Li, Shanshan Gong, Hongnan Zhang,\* Xueping Zhang\* and Xiaohong Qin



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**Recent progress in metal halide perovskite-based photocatalysts: physicochemical properties, synthetic strategies, and solar-driven applications**

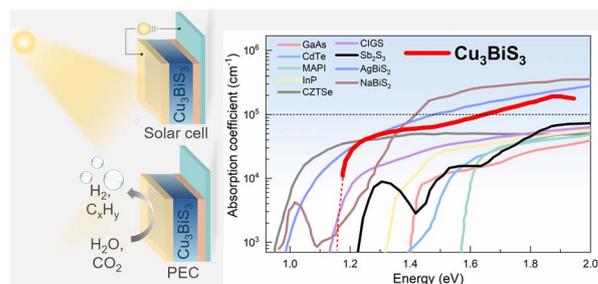
Yanmei Feng, Daimei Chen,\* Min Niu, Yi Zhong, Hao Ding, Yingmo Hu, Xiangfeng Wu and Zhongyong Yuan



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**Prospects of copper–bismuth chalcogenide absorbers for photovoltaics and photoelectrocatalysis**

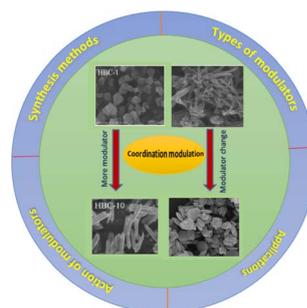
Daniely Reis Santos, Sudhanshu Shukla\* and Bart Vermang



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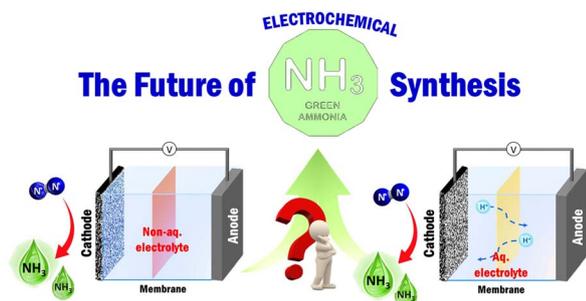
**Coordination modulation: a way to improve the properties of metal–organic frameworks**

Fahime Bigdeli, Marcus N. A. Fetzner, Berna Nis, Ali Morsali\* and Christoph Janiak\*



## PERSPECTIVE

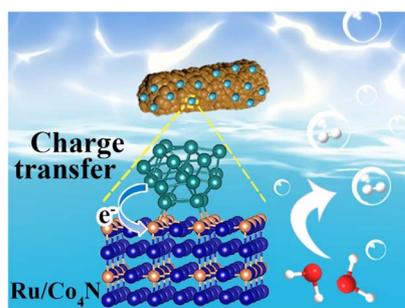
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**A perspective on the future of electrochemical ammonia synthesis: aqueous or non-aqueous?**

Divyani Gupta, Alankar Kafle, Sukhjot Kaur and Tharamani C. Nagaiah\*

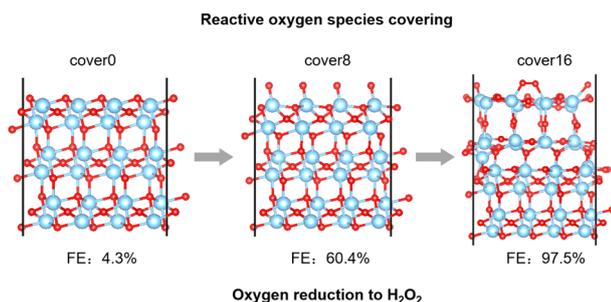
## COMMUNICATIONS

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**Realization of electron-deficient Ru sites via Co<sub>4</sub>N coupling for synergistically enhanced alkaline hydrogen evolution**

Mengyuan Xing, Xuyun Guo, Wenfang Yuan, Wenxuan Chen, Mengmeng Du, Lejuan Cai,\* Valeria Nicolosi, Yang Chai and Bocheng Qiu\*

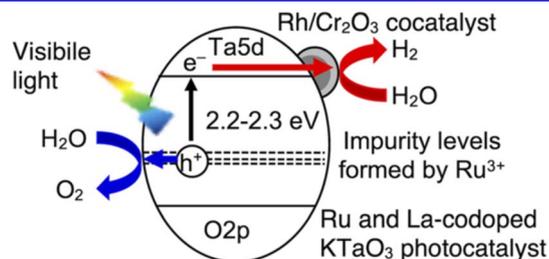
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**Shifting the O<sub>2</sub> reduction pathway from H<sub>2</sub>O to H<sub>2</sub>O<sub>2</sub> via *in situ* reconstruction of Ti<sub>2</sub>O<sub>3</sub> nanoparticles**

Yongchao Yao, Huiqing Wang, Kai Dong, Haobo Li, Jie Liang, Ruizhi Li, Shengjun Sun, Zhengwei Cai, Xun He, Dongdong Zheng, Yonglan Luo, Sulaiman Alfaifi, Dongwei Ma,\* Wenchuang (Walter) Hu\* and Xuping Sun\*

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**Overall water splitting under visible light irradiation****Development of visible-light-responsive Ru-doped KTaO<sub>3</sub> photocatalyst for overall water splitting with one-step photoexcitation and the effects of codoping with La**

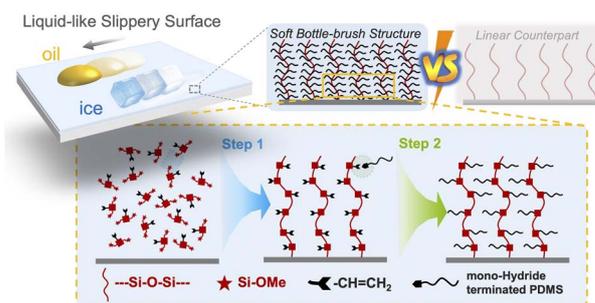
Akihide Iwase,\* Miyu Kasahara and Haruka Misono



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## A fluffy all-siloxane bottlebrush architecture for liquid-like slippery surfaces

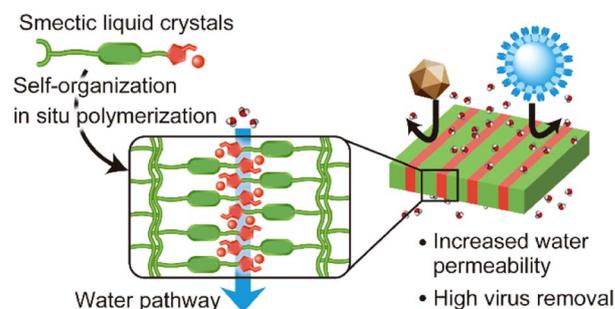
Yunjiao Gu, He Zhou, Fenghua Liu, Shuxue Zhou\* and Weiping Wu\*



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## Development of liquid-crystalline smectic nanoporous membranes for the removal of SARS-CoV-2 and waterborne viruses

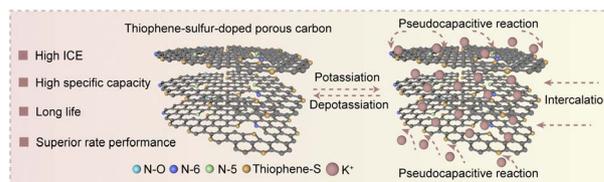
Takeshi Sakamoto,\* Kazuhiro Asakura, Naru Kang, Riki Kato, Miaomiao Liu, Tsuyoshi Hayashi, Hiroyuki Katayama\* and Takashi Kato\*



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## Thiophene-sulfur doping in nitrogen-rich porous carbon enabling high-ICE/rate anode materials for potassium-ion storage

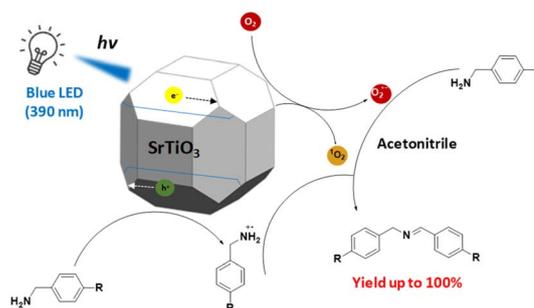
Chuang Qiu, Anuj Kumar, Daping Qiu, Mohammad Tabish, Jiapeng Zhang, Zhijie Jiang, Ang Li, Ghulam Yasin, Xiaohong Chen and Huaihe Song\*



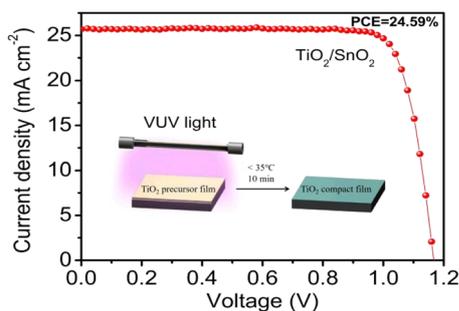
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## Photocatalytic oxidative amine coupling using polyhedral SrTiO<sub>3</sub> crystals

Zong-Li Chen and Michael H. Huang\*



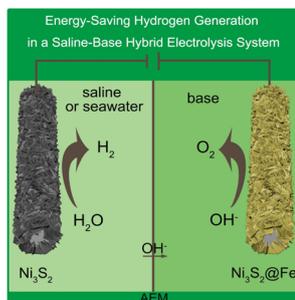
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### Room-temperature processed TiO<sub>2</sub> to construct composite electron transport layers for efficient planar perovskite solar cells

Jiadoo Wang, Zhuo Dong, Jiajun Wang, Junwei Zhang, Zeyu Zhai, Fazheng Qiu, Jinpeng Wu,<sup>\*</sup> Yuan Lin and Jingbo Zhang<sup>\*</sup>

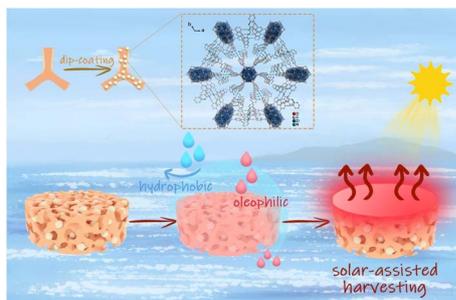
22216



### Energy-saving and sustainable saline-base electrolytic hydrogen production system enabled by nickel sulfide-based catalysts

Chengyi Lu, Shuhe Yang, Yunxiang Zhao, Yong Cao, Qiaogao Huang, Wenxin Zhu<sup>\*</sup> and Jianlong Wang<sup>\*</sup>

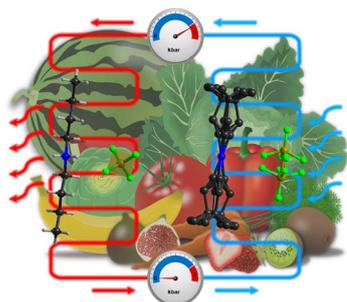
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### A hydrophobic–superoleophilic 2D Zr-based alkyne-rich metal–organic framework for oil/water separation and solar-assisted oil evaporation

Qian-Ru Luo, Yuan-Hui Zhong, Lai-Hon Chung,<sup>\*</sup> Zhixin Jiang, Qia-Chun Lin, Xin-Ke Xu, Xinhe Ye, Wei-Ming Liao and Jun He<sup>\*</sup>

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### Structure and thermal property relationships in the thermomaterial di-*n*-butylammonium tetrafluoroborate for multipurpose cooling and cold-storage

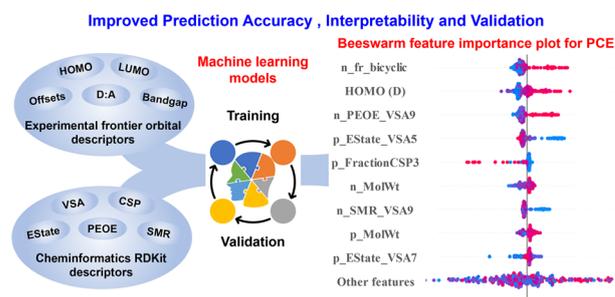
Javier García-Ben, Juan Manuel Bermúdez-García, Richard J. C. Dixey, Ignacio Delgado-Ferreiro, Antonio Luis Llamas-Saiz, Jorge López-Beceiro, Ramón Artiaga, Alberto García-Fernández, Ute B. Cappel, Bruno Alonso, Socorro Castro-García, Anthony E. Phillips, Manuel Sánchez-Andújar<sup>\*</sup> and María Antonia Señaris-Rodríguez<sup>\*</sup>



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## Machine-learning-guided prediction of photovoltaic performance of non-fullerene organic solar cells using novel molecular and structural descriptors

Rakesh Suthar, Abhijith T and Supravat Karak\*



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## Thiophene-fused boron dipyrromethenes as energy efficient near-infrared photocatalysts for radical polymerizations

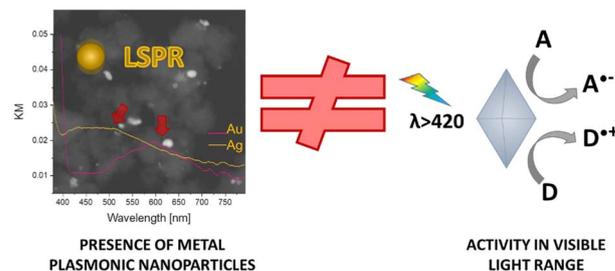
Alex Stafford, Seth R. Allen, Tod A. Grusenmeyer, Connor J. O'Dea, Laura Estergreen, Sean T. Roberts\* and Zachariah A. Page\*



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## How much is the plasmonic effect worth in photocatalysis? Mechanisms of photocatalytic activity enhancement in composites with metallic nanostructures

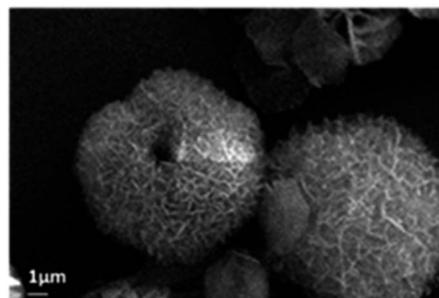
Anna Jakimińska and Wojciech Macyk\*



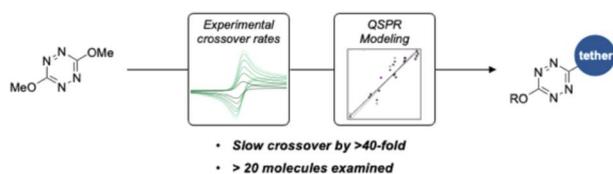
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## $\alpha/\beta$ -Ni(OH)<sub>2</sub> phase control by F-ion incorporation to optimise hybrid supercapacitor performance

Xuerui Yi, Veronica Celorrio, Haoyu Zhang, Neil Robertson\* and Caroline Kirk\*



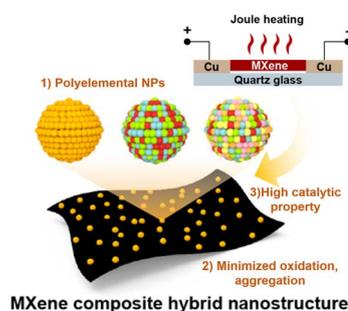
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### Identifying structure-function relationships to modulate crossover in nonaqueous redox flow batteries

Brianna Jett, Autumn Flynn, Matthew S. Sigman\* and Melanie S. Sanford\*

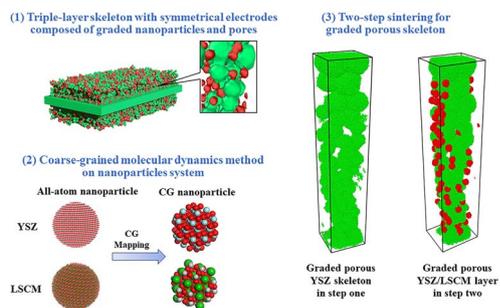
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### Solution-free synthesis of MXene composite hybrid nanostructures by rapid Joule heating

Jeesoo Yoon, Yong-Jae Kim, Ji-Yoon Song, Aqil Jamal, Issam Gereige, Chansol Kim\* and Hee-Tae Jung\*

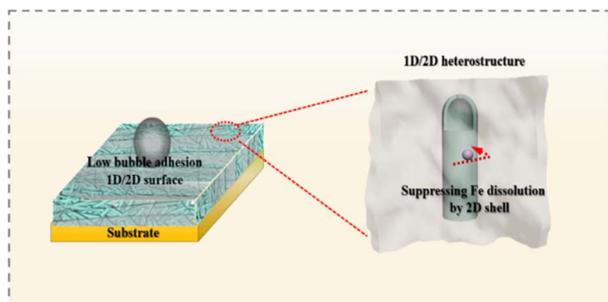
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### Coarse-grained molecular dynamics modeling and analysis of graded porous electrodes of reversible solid oxide cells sintered in two steps

Chao Yang, Ran Guo, Yu Wu,\* Baowei Pan, Jiatang Wang\* and Jinliang Yuan\*

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### 1D/2D NiFeP/NiFe-OH heterostructure: roles of the unique nanostructure in stabilizing highly efficient oxygen evolution reaction

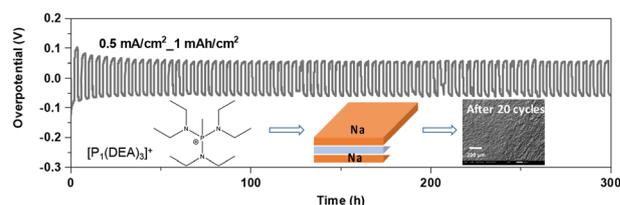
Fuzhen Zhao, Xin Zheng, Xinyu Mao, Huicong Liu, Liqun Zhu, Weiping Li, Hui Ye\* and Haining Chen\*



22329

### Development of tris(amino)phosphonium electrolytes for high performing sodium batteries

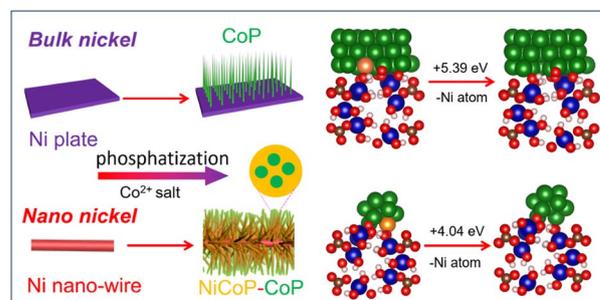
Ju Sun, Colin S. M. Kang, Gongyue Huang, Federico Maria Ferrero Vallana, Ajit Kumar, Luke A. O'Dell, Montserrat Galceran, Oliver Hutt, Patrick C. Howlett, Maria Forsyth\* and Jennifer M. Pringle\*



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### Nanosurface-induced construction of NiCoP–CoP heterostructure nanobristle electrodes for highly efficient alkaline hydrogen evolution reaction

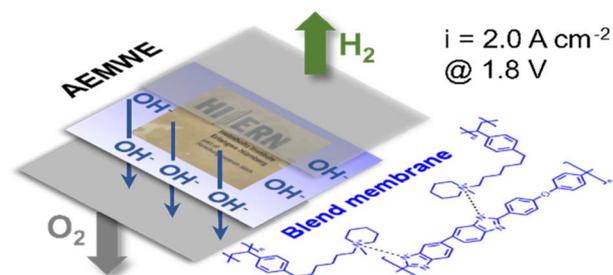
Peng Liu, Juan Wang, Yiming Sui, Guangyao Zhao, Rui Yao, Dongsheng Xia, Zhenbin Guo, Feiyu Kang, Lei Wang\* and Cheng Yang\*



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### Novel side chain functionalized polystyrene/O-PBI blends with high alkaline stability for anion exchange membrane water electrolysis (AEMWE)

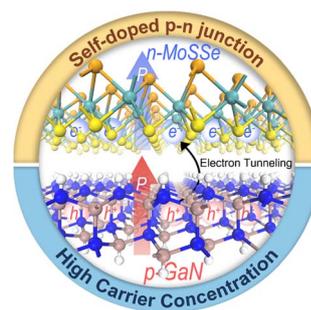
Linus Hager,\* Manuel Hegelheimer, Julian Stonawski, Anna T. S. Freiberg, Camilo Jaramillo-Hernández, Gonzalo Abellán, Andreas Hutzler, Thomas Böhm, Simon Thiele and Jochen Kerres\*



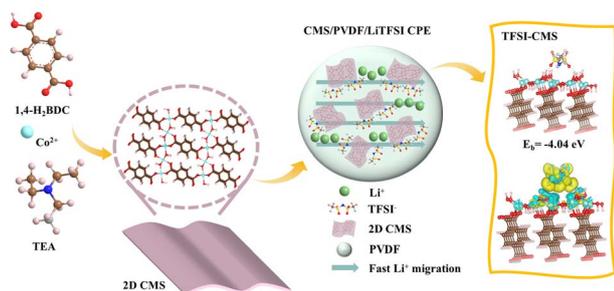
22360

### Self-doped p–n junctions with high carrier concentration in 2D GaN/MoSSe heterostructures: a first-principles study

Dawei Deng, Rutong Si, Bo Wen, Nicola Seriani, Xiao-Lin Wei, Wen-Jin Yin\* and Ralph Gebauer\*



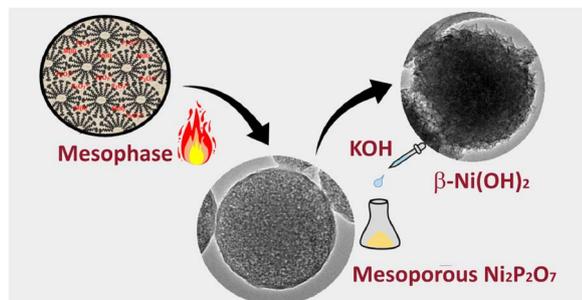
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### Composite polymer electrolytes incorporating two-dimensional metal–organic frameworks for ultralong cycling in solid-state lithium batteries

Han Jiang, Yongqian Du, Xuanyu Liu, Jiangrong Kong,<sup>\*</sup> Meiqi Huang, Peng Liu and Tao Zhou

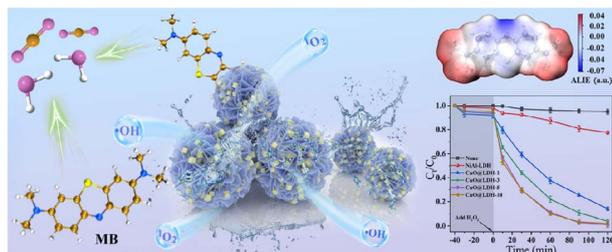
22384



### Fabrication of mesoporous nickel pyrophosphate electrodes and their transformation to nickel hydroxide with decent capacitance in alkaline media

Işıl Ulu, Burak Ulgut and Ömer Dag<sup>\*</sup>

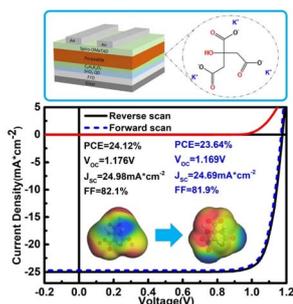
22396



### 3D flower-like CuO@NiAl-LDH microspheres with enhanced removal affinity to organic dyes: mechanistic insights, DFT calculations and toxicity assessment

Yao Chen, Honglin Lian, Hao Wang, Jun Qin, Xiaolang Chen<sup>\*</sup> and Zongcheng Lu

22409



### Synergistic interface passivation with potassium citrate as an eco-friendly conductive adhesive in perovskite solar cells

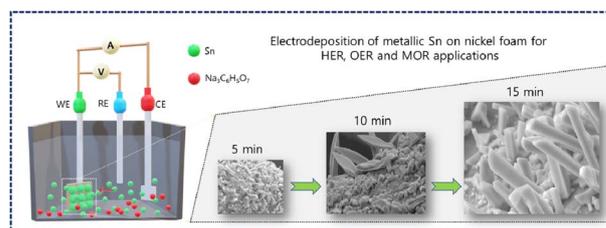
Rui Wu, Lan Xiao, Ziyi Wang, Chang Shi, Shuping Xiao, Wuchen Xiang, Zhongli Qin,<sup>\*</sup> Xiangbai Chen, Guojia Fang and Pingli Qin<sup>\*</sup>



22419

### Methanol-assisted energy-saving green hydrogen production using electrodeposited 3D-metallic tin as an electrocatalyst

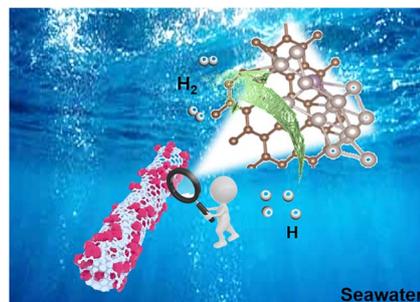
Aparna Sajeev, Karthikeyan Krishnamoorthy, Parthiban Pazhamalai, Kousik Bhunia, Arunprasath Sathyaseelan and Sang-Jae Kim\*



22430

### Ultrafast carbothermal shocking fabrication of cation vacancy-rich Mo doped Ru nanoparticles on carbon nanotubes for high-performance water/seawater electrolysis

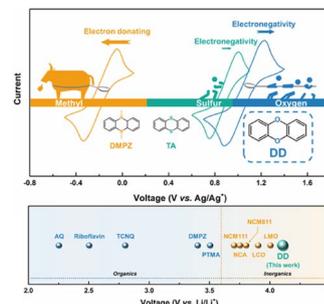
Jianpeng Sun, Zhan Zhao, Zizhen Li, Zisheng Zhang, Rufan Zhang\* and Xiangchao Meng\*



22441

### High-voltage (4.1 V) organic electrode material with an oxygen redox center

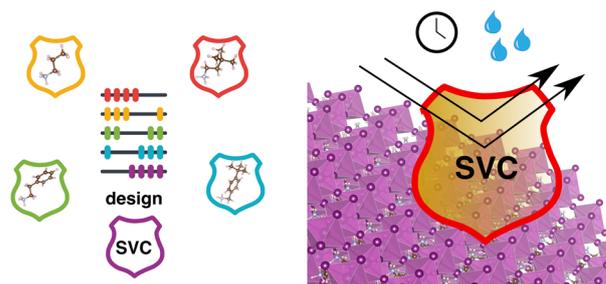
Sechan Lee, Giyun Kwon, Taewon Kang, Jihyeon Kim, Byungju Lee, Chunjoong Kim, Changsoo Lee, Youngsu Kim, Joohyeon Noh, Young-Sang Yu,\* Dongwhan Lee\* and Kisuk Kang\*



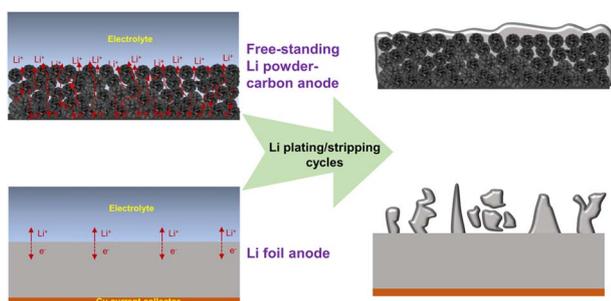
22449

### Supramolecular virtual crystal: a fast and accurate guideline for molecular passivation of perovskite materials

Juan Camilo Alvarez-Quiceno,\* Jorge Mario Osorio-Guillén and Pascal Pochet



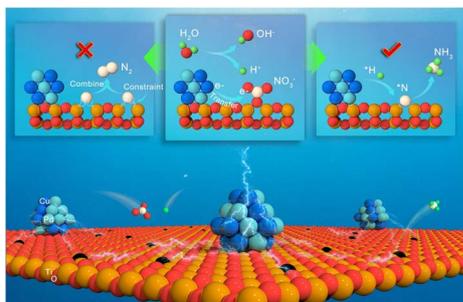
22456



### Uniform distribution of metallic lithium and carbon on the nanoscale for highly stable carbon-based lithium metal anodes

Zipeng Jiang, Haiyan Liu, Tao Liu, Chenyang Meng, Zhijie Jiang, Mohammad Tabish, Xiaoqi Yu, Ang Li, Xiaohong Chen and Huaihe Song\*

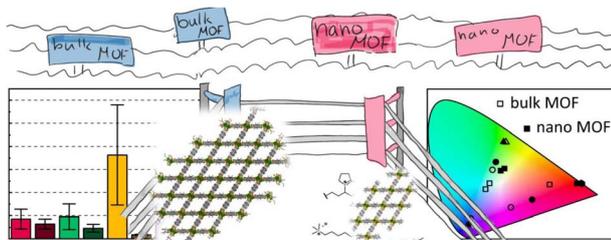
22466



### Enhanced localized electron density from PdCu nanoparticle loading on a defective TiO<sub>2</sub> support for selective nitrate electroreduction to ammonia

Haoran Wu, Heng Guo,\* Fengying Zhang, Peng Yang, Jiaxin Liu, Yuantao Yang, Zhen-Feng Huang, Chenyuan Zhu, Weitao Wang, Xin Tu,\* Guidong Yang and Ying Zhou\*

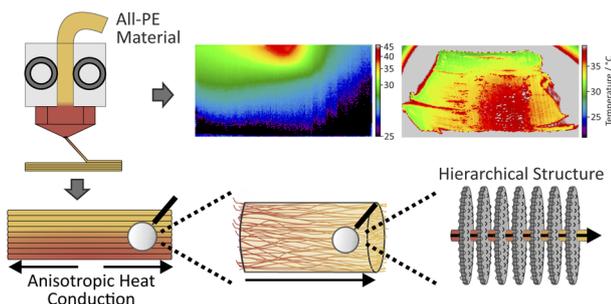
22478



### Nano vs. bulk: surfactant-controlled photophysical and morphological features of luminescent lanthanide MOFs

Moritz Maxeiner, Lea Wittig, Alexander E. Sedykh, Thomas Kasper and Klaus Müller-Buschbaum\*

22492



### High and tuneable anisotropic thermal conductivity controls the temperature distribution of 3D printed all-polyethylene objects

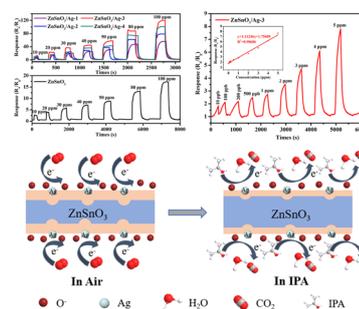
Ina Klein, Thomas Tran, René Reiser, Maximilian Theis, Sabine Rosenfeldt, Marius Schöttle, Carl Schirmeister, Peter Bösecke, Stefan Rettinger, Rolf Mülhaupt and Markus Retsch\*



22503

### ppb-Level detection of isopropanol based on porous ZnSnO<sub>3</sub>/Ag through the synergistic effects of Ag and amorphous nanocube structures

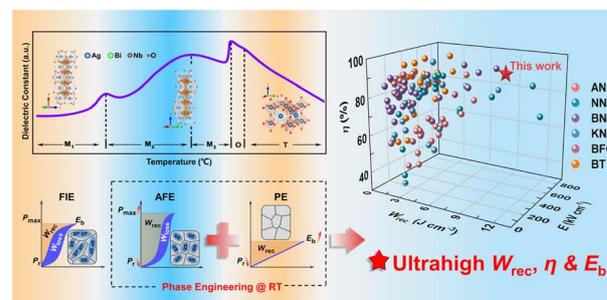
Fangling Zhou, Zhuangzhuang Mu, Zhenyu Yuan,\*  
Hongmin Zhu, Xin Yan,\* Hongliang Gao and Fanli Meng\*



22512

### Superior energy storage performance realized in antiferroelectric 0.10 wt% MnO<sub>2</sub>-AgNbO<sub>3</sub> ceramics via Bi-doping induced phase engineering

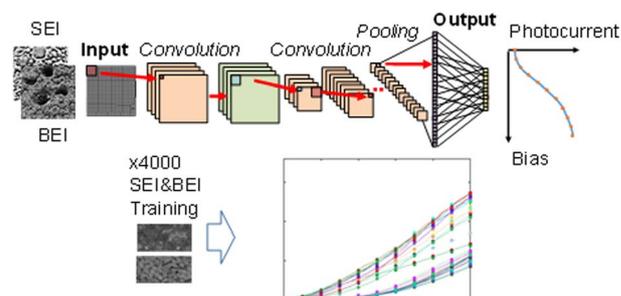
Jing Wang, Xuhui Fan, Zhen Liu, Kongjun Zhu, Hao Yuan,  
Zehan Zheng, Lei Zhao,\* Ji Zhang,\* Qibin Yuan\*  
and Jing-Feng Li\*



22522

### Convolutional neural network prediction of the photocurrent–voltage curve directly from scanning electron microscopy images

Yuta Hayashi, Yuya Nagai, Zhenhua Pan  
and Kenji Katayama\*



22533

### Correction: An organic/inorganic coating strategy that greatly enhanced sensing performances and reliability of all-fabric piezoresistive sensors

Guangliang Tian, Kangli Xu, Yaoli Huang, Xinxin You, Wenhua Yu, Honggang Liu, Juan Li, Jiawei Liu, Xiangyu Jin,  
Haoxuan Li,\* Qinfei Ke\* and Chen Huang\*

