

# Journal of Materials Chemistry A

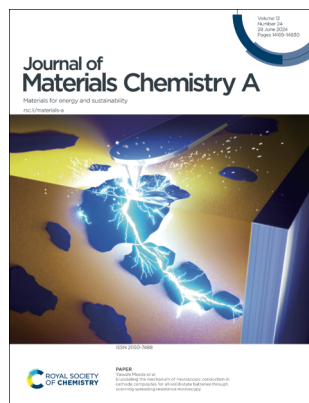
Materials for energy and sustainability

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## IN THIS ISSUE

ISSN 2050-7488 CODEN JMCAET 12(24) 14169–14830 (2024)



### Cover

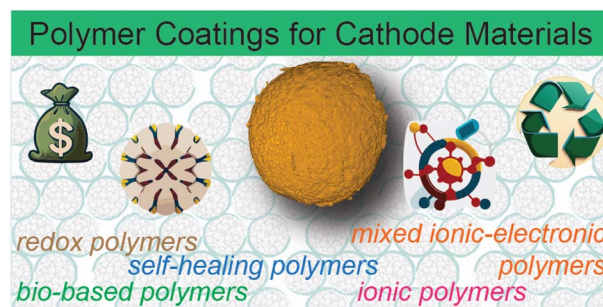
See Yasushi Maeda *et al.*, pp. 14380–14388. Image reproduced by permission of Yasushi Maeda from *J. Mater. Chem. A*, 2024, 12, 14380.

## REVIEWS

14186

### Prospects of polymer coatings for all solid-state and emerging Li-ion batteries

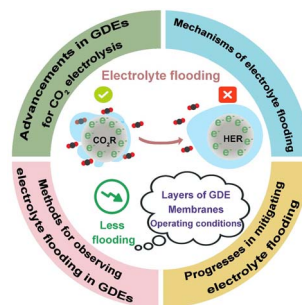
Ruhul Amin,\* Umair Nisar, Muhammad Mominur Rahman, Marm Dixit, Ali Abouimrane and Ilias Belharouak\*



14206

### Insights into electrolyte flooding in flexible gas diffusion electrodes for CO<sub>2</sub> electrolysis: from mechanisms to effective mitigation strategies

Yuming Wu,\* Hesamoddin Rabiee, Xiu Song Zhao, Geoff Wang and Yijiao Jiang\*



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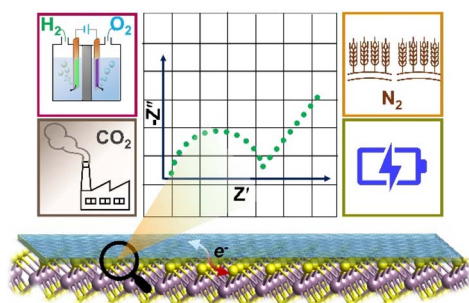
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## PERSPECTIVE

14334

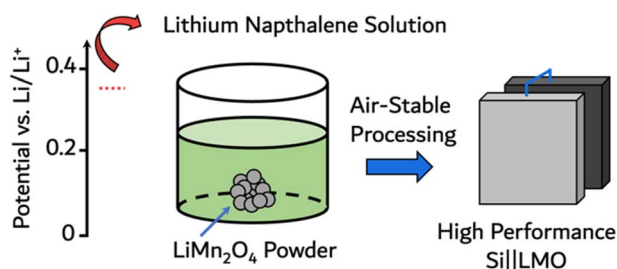


### Deciphering interfacial charge transfer mechanisms in electrochemical energy systems through impedance spectroscopy

Karamjyoti Panigrahi, Santanu Mal and Sayan Bhattacharyya\*

## COMMUNICATIONS

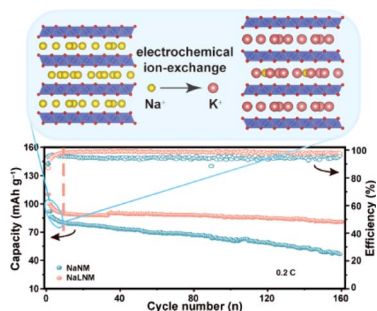
14354



### Chemical pre-lithiation of $\text{LiMn}_2\text{O}_4$ balances the low first cycle efficiency of silicon anodes

Jesse S. Ko,\* Bing Tan, Matthew W. Logan, Spencer A. Langevin and Konstantinos Gerasopoulos

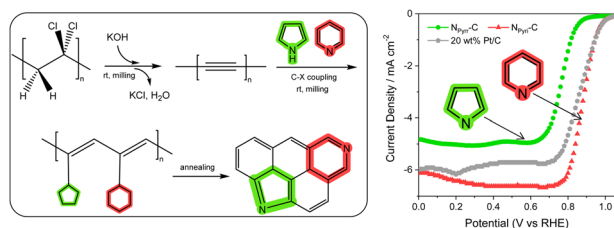
14360



### Realizing a single-phase reaction and $\text{K}^+$ /vacancy disordering in $\text{P2-K}_{0.56}\text{Na}_{0.11}\text{Li}_{0.12}\text{Ni}_{0.22}\text{Mn}_{0.66}\text{O}_2$ by lithium substitution for potassium-ion batteries

Yongwei Tang, Haojie Dong, Mengting Liu, Guang-Xu Wei, Jin-Hong Li, Wenjie Tang, Yifeng Liu, Xu Zhu, Yi-Hu Feng, Qiang Liu, Da-Wei Wang, Yao Xiao,\* Peng-Fei Wang\* and Bing Xiao\*

14367



### Topotactic N-doped carbon for efficient oxygen reduction reaction

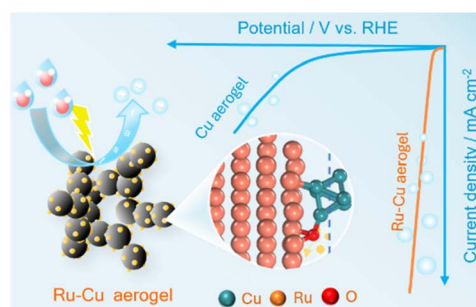
Miaosen Yang, Tian Zhang, Danni Wang, Yingna Chang and Guoxin Zhang\*



14372

### Interfacial electron modulation for Ru particles on Cu aerogel as an efficient electrocatalyst for hydrogen evolution reaction

Haoxin Fan, Xinhao Wan, Yarui Tang, Jianqi Ye, Jie Gao, Wei Gao\* and Dan Wen\*

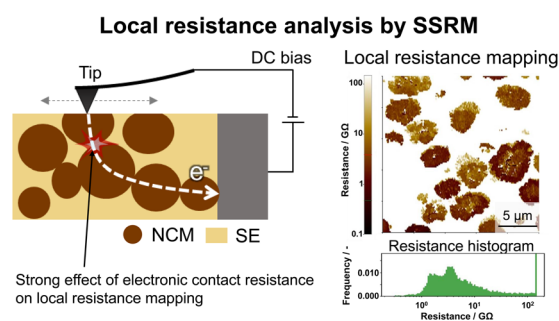


PAPERS

14380

### Elucidating the mechanism of microscopic conduction in cathode composites for all-solid-state batteries through scanning spreading resistance microscopy

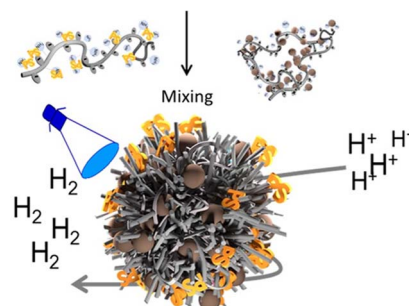
Hirota Gamo, Yasushi Maeda,\* Tetsu Kiyobayashi, Zyun Siroma and Hikaru Sano



14389

### Hybrid nanoreactors formed by interpolyelectrolyte complex formation: a colloidal platform for light-driven catalysis

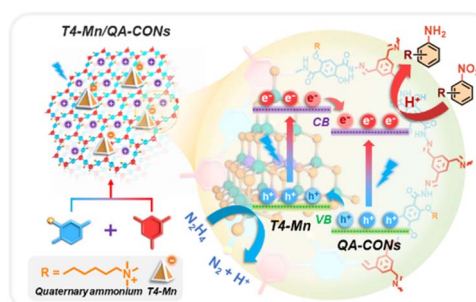
Afshin Nabiyani,\* Christof Neumann, Andrey Turchanin and Felix H. Schacher\*



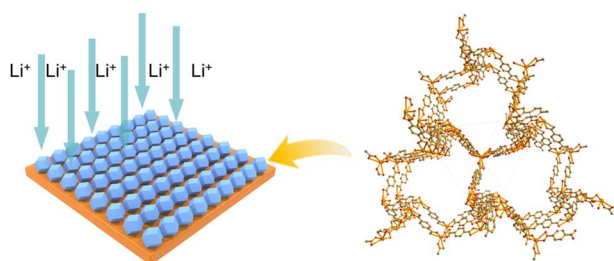
14398

### Semiconductor-cluster-loaded ionic covalent organic nanosheets with enhanced photocatalytic reduction reactivity of nitroarenes

Jing-Ni Zhang, Jia-Xing Liu, Hao Ma, Xiao Luo, Cheng-Kun Han, Rui Zhou, Shang-Fu Yuan,\* Dong-Sheng Li and Tao Wu\*



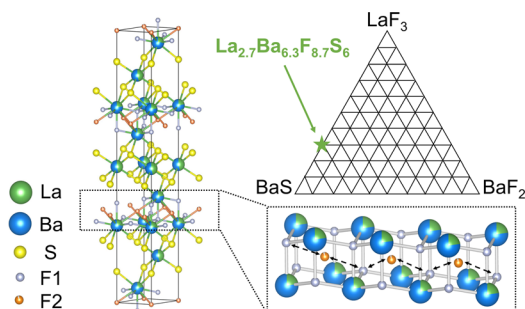
14408



### Constructing a robust artificial solid electrolyte interphase with a metal–organic framework for a stable Li metal anode

Long Chen, Xiaohui Lin, Zhicheng Zheng, Ziwei Guo, Zuxin Wen, Pan Xiong,\* Gen Chen\* and Junwu Zhu\*

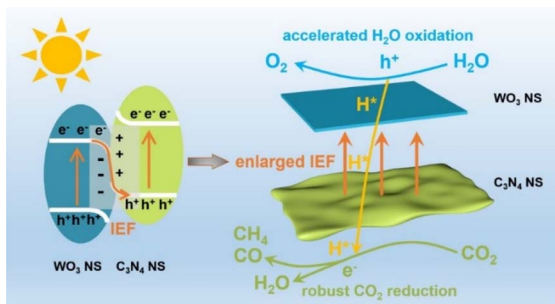
14419



### Fluorosulfide $\text{La}_{2.7}\text{Ba}_{6.3}\text{F}_{8.7}\text{S}_6$ with a double-layer honeycomb structure enabling fluoride-ion conduction

Shintaro Tachibana, Chengchao Zhong,\* Takeshi Tojigamori, Hidenori Miki, Toshiyuki Matsunaga and Yuki Oriksa\*

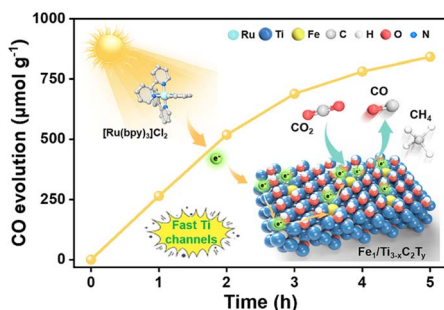
14426



### Constructing Z-scheme $\text{WO}_3/\text{C}_3\text{N}_4$ heterojunctions with an enlarged internal electric field and accelerated water oxidation kinetics for robust $\text{CO}_2$ photoreduction

Zhijia Song, Qian Chen, Zhiwei Sun, Kuan Chang, Zhaoxiong Xie and Qin Kuang\*

14437



### Engineering fast Ti electron channels to single-atom Fe for enhanced $\text{CO}_2$ photoreduction

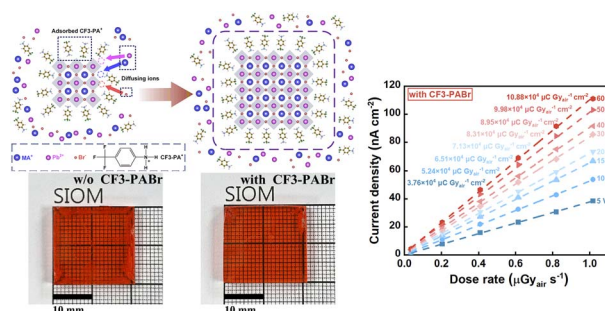
Wuyi Feng, Pan Zhu, Shouyuan Li, Jiantao Fu, Haoming Niu, Zhenyu Ren, Shoujie Liu, Lirong Zheng, Di Zhao\* and Jiatao Zhang\*



14446

### Synergistic crystallization regulation and defect passivation for growth of high-quality perovskite single crystals towards ultrasensitive X-ray detection

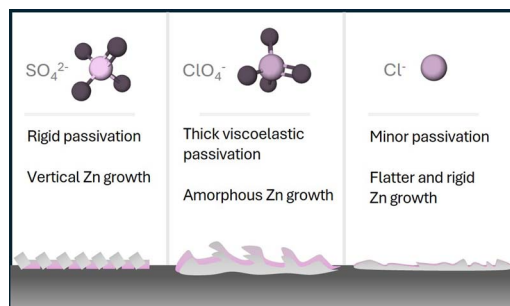
Zhilong Chen, Hu Wang,\* Jie Fu, Pengxiang Wang, Xin Liu, Hao Dong, Shuang Yang\* and Yuchuan Shao\*



14456

### To what extent do anions affect the electrodeposition of Zn?

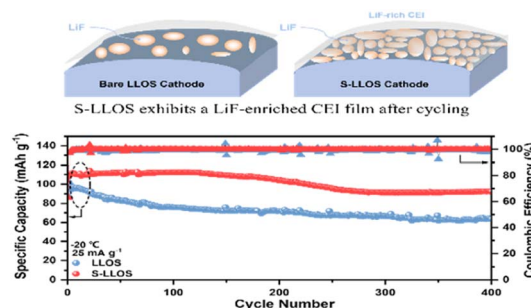
Gil Bergman, Netta Bruchiel-Spanier, Omer Bluman, Noam Levi, Sara Harpaz, Fyodor Malchick, Langyuan Wu, Masato Sonoo, Munseok S. Chae, Guoxiu Wang, Daniel Mandler, Doron Aurbach, Yong Zhang, Netanel Shpigel\* and Daniel Sharon\*



14467

### Low-temperature tolerant lithium-rich manganese-based cathode enabled by facile SnO<sub>2</sub> decoration

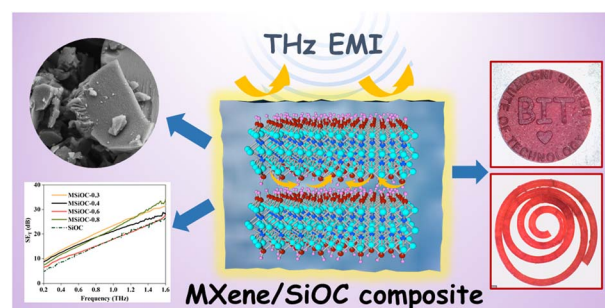
Diaohan Wang, Wenlei Wang, Kaihua Li, Jinze Song, Xinhai Yuan, Qinghong Huang, Zexun Tang,\* Lijun Fu\* and Yuping Wu



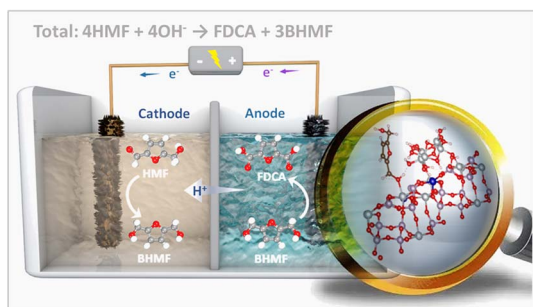
14479

### Photocured Ti<sub>3</sub>C<sub>2</sub>T<sub>x</sub> MXene/SiOC ceramic composite for electromagnetic interference shielding in the terahertz band

Ruyue Su, Jingyi Chen, Xueqin Zhang, Wenqing Wang, Rujie He\* and Ying Li



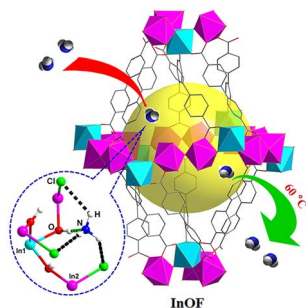
14491



### Construction of NiCo-metaphosphate/hydroxide with synergistic heterostructure for sustainable biomass electro-oxidation

Jie Xiong, Feng Wang, Botao Zhu, Kaixuan You, Shuo Wu, Peng Jin\* and Lai Feng\*

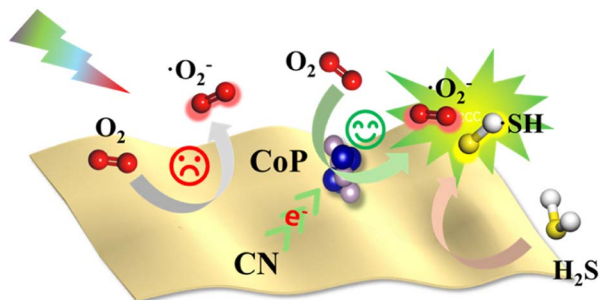
14501



### A novel topological indium–organic framework for reversible ammonia uptake under mild conditions and catalysis

Xin He, Shuying Gao, Ri Peng, Dunru Zhu\* and Fei Yu\*

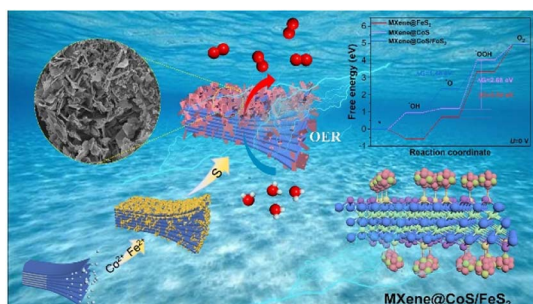
14508



### Boosting oxygen activation by CoP/carbon nitride photocatalyst in low-concentration H<sub>2</sub>S oxidation

Jiali Wang, Biqi Chen, Fanghua Zeng, Xue Feng Lu, Yidong Hou, Wei Lin and Can Yang\*

14517



### Synergistically coupling CoS/FeS<sub>2</sub> heterojunction nanosheets on a MXene via a dual molten salt etching strategy for efficient oxygen evolution reaction

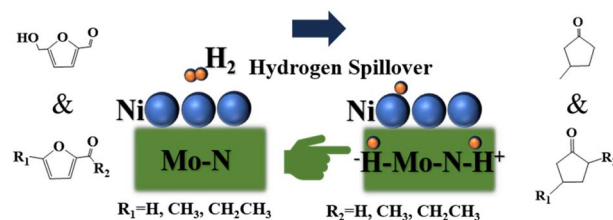
Zuliang Zhang, Tian Liang, Chulong Jin, Shuyi Zhang, Yuanyuan Cui,\* Jinxing Chen\* and Xiaojun Zeng\*



14531

### Hydrogen-mediated acid-base transformation of Ni supported $\text{Mo}_5\text{N}_6$ for hydrogenative rearrangement of furfural derivatives

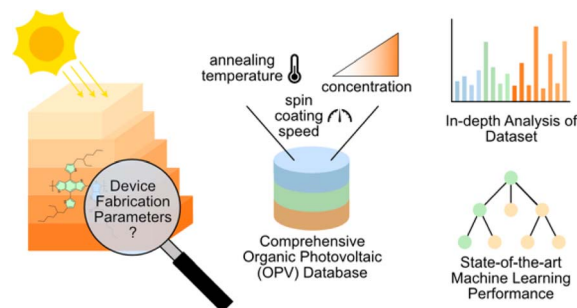
Xiang Li,\* Chong Ran, Yi Liu, Guorong Fan, Peng Wang, Lu He, Yuling Yang, Xiuxiu Zou, Ji Zhang, Shangxing Chen, Zongde Wang and Qiang Deng\*



14540

### Beyond molecular structure: critically assessing machine learning for designing organic photovoltaic materials and devices

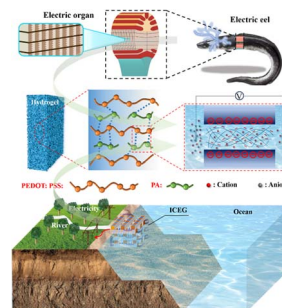
Martin Seifrid,\* Stanley Lo, Dylan G. Choi, Gary Tom, My Linh Le, Kunyu Li, Rahul Sankar, Hoai-Thanh Vuong, Hiba Wakidi, Ahra Yi, Ziyue Zhu, Nora Schopp, Aaron Peng, Benjamin R. Luginbuhl, Thuc-Quyen Nguyen\* and Alán Aspuru-Guzik\*



14559

### Negative space charge modulated ion transport through PEDOT:PSS hydrogels integrating nanofluidic channels for highly efficient osmotic energy harvesting

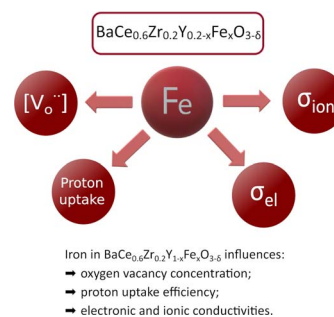
Rui Zhu, Peng Sun, Guofeng Cui,\* Yaoguang Yu,\* Shaojun Ke and Jie Zhao



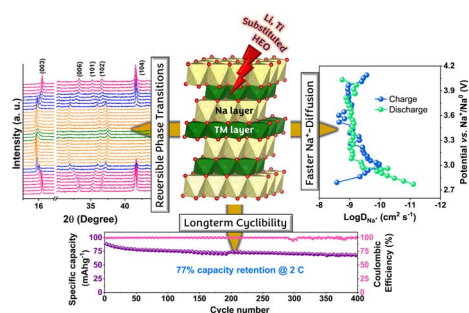
14569

### Influence of iron content on water uptake and charge transport in $\text{BaCe}_{0.6}\text{Zr}_{0.2}\text{Y}_{0.2-x}\text{Fe}_x\text{O}_{3-\delta}$ triple-conducting oxides

Jagoda Budnik,\* Aleksandra Mielewczyk-Gryń, Maria Gazda and Tadeusz Miruszewski



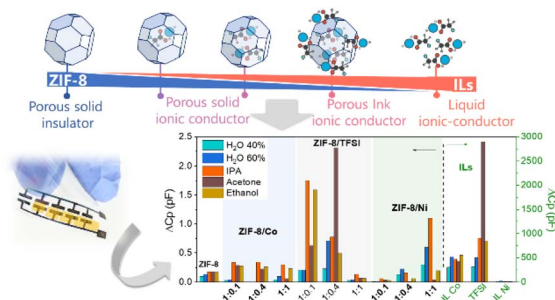
14583



### A high entropy O3-Na<sub>1.0</sub>Li<sub>0.1</sub>Ni<sub>0.3</sub>Fe<sub>0.1</sub>Mn<sub>0.25</sub>Ti<sub>0.25</sub>O<sub>2</sub> cathode with reversible phase transitions and superior electrochemical performances for sodium-ion batteries

Arindam Ghosh, Rashmi Hegde and Premkumar Senguttuvan\*

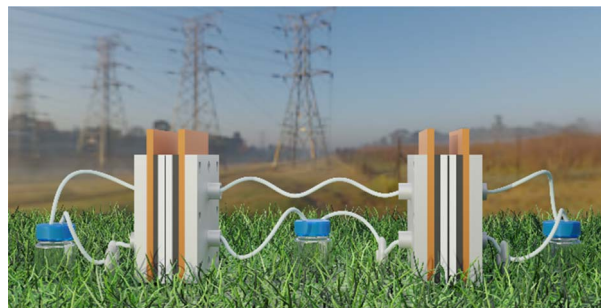
14595



14636

### Strategic usage of redox active materials and sacrificial Zn electrodes for spontaneous hydrogen evolution reaction

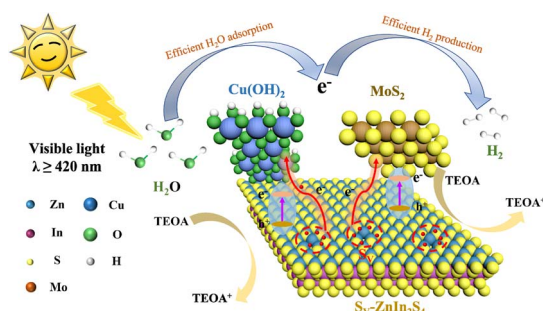
Tae Yup Jeong, Chandan Chandru Gudal, Byeongkyu Kim, Yong Seok Kim, Tae Yeon Ha, Anki Reddy Mule, Pil J. Yoo and Chan-Hwa Chung\*



14646

### In situ construction of Ohmic/Schottky-type MoS<sub>2</sub>/S<sub>v</sub>-ZnIn<sub>2</sub>S<sub>4</sub>/Cu(OH)<sub>2</sub> dual-junction photocatalysts with enhanced water splitting into hydrogen generation activity

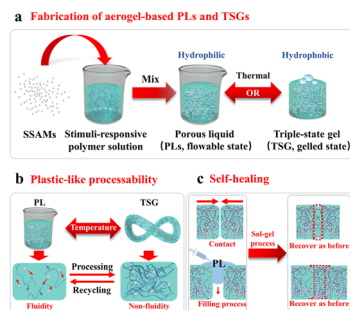
Aihua Yan, Tongyang Zhang, Fei Huang,\* Shijian Lu, Quande Wang, Huaqi Yuan, Ye Gao, Wenxue Zhao, Jixu Zhang and Zigao Su



14659

### Reversible thermo-responsive transitions between aerogel-based porous liquids and solid–liquid–vapor triple-state gels

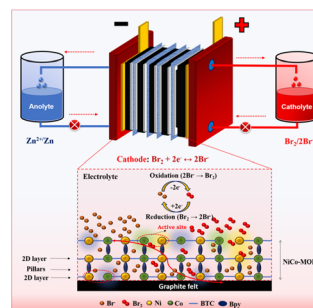
Leqin Li, Miaojiang Wu, Sa Yao, Yinglai Hou, Ruizhe Yuan, Jianhe Liao\* and Xuetong Zhang\*



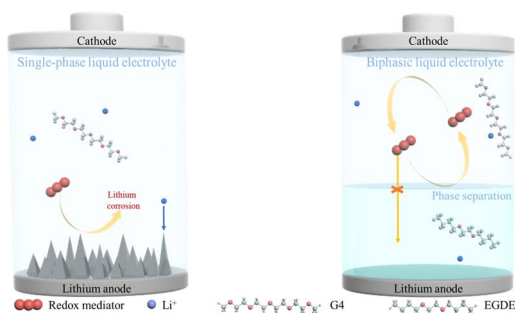
14669

### Bimetallic metal–organic framework: an efficient electrocatalyst for bromine-based flow batteries

Raghupandiyam Naresh, Kalaiarasi Satchidhanandam, Kaushek Rahul Ilancheran, Bebin Ambrose, Murugavel Kathiresan and P. Ragupathy\*



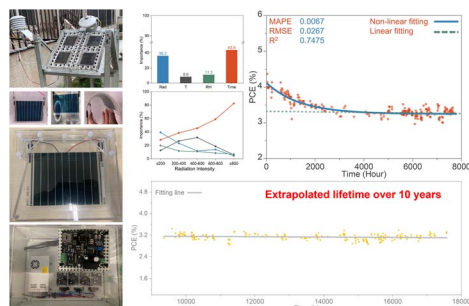
14679



### Solvation structure regulation for an ether/ether biphasic electrolyte to balance cathodic and anodic reactions in metal-based batteries

Qing Han, Shilong Jiao, Xiao Liu, Tengfei Bian and Yong Zhao\*

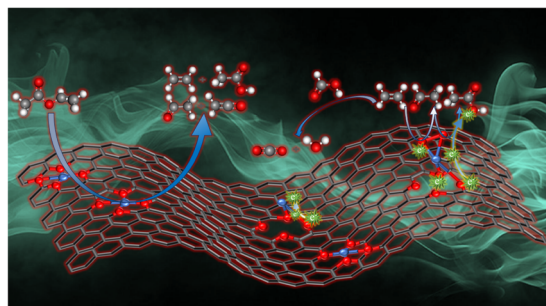
14688



### Analyzing the outdoor degradation behavior of organic solar modules in North China

Shaopeng Liu, Dawei Zhang,\* Hans-Joachim Egelhaaf, Gaoyuan Wang, Xiaogang Li, Thomas Heumüller, Christoph J. Brabec and Ning Li\*

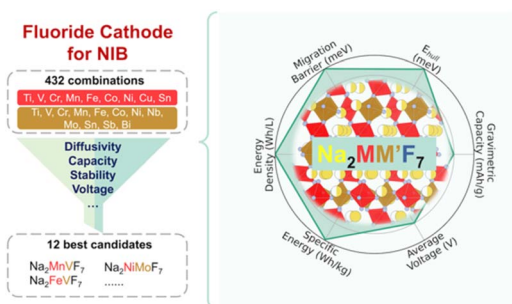
14698



### Catalytic oxidation mechanism of ethyl acetate on O-ligand-single-atom-Ni/2-dimensional reduced graphene oxide: the essential role of the O ligand

Xinjie Wang, Juntian Li, Juan Li, Binghua Jing, Yun Sun, Teng Wang, Didi Li, Haibo Huang and Zhimin Ao\*

14709



### Weberite $\text{Na}_2\text{MM}'\text{F}_7$ ( $M, M' = \text{redox-active metal}$ ) as promising fluoride-based sodium-ion battery cathodes

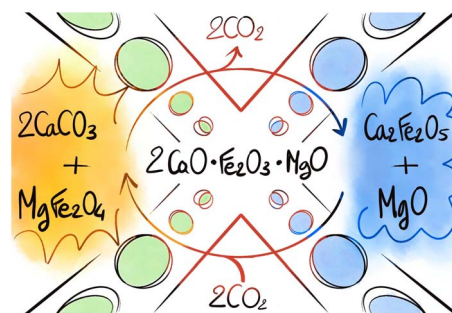
Tenglong Lu, Sheng Meng\* and Miao Liu\*



14721

## Reversible sorption of carbon dioxide in Ca–Mg–Fe systems for thermochemical energy storage applications

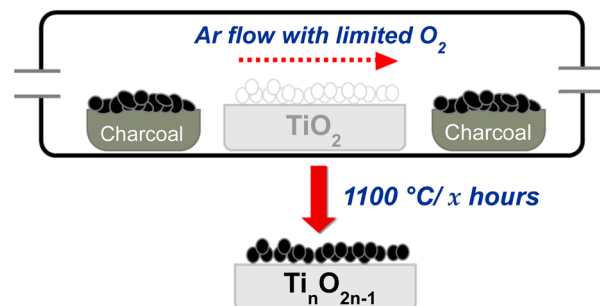
Lucie Desage, Terry D. Humphries,\* Mark Paskevicius and Craig E. Buckley



14734

## Activated charcoal-mediated non-contact carbothermal reduction of TiO<sub>2</sub> for controlled synthesis of Magnéli phase titanium suboxides

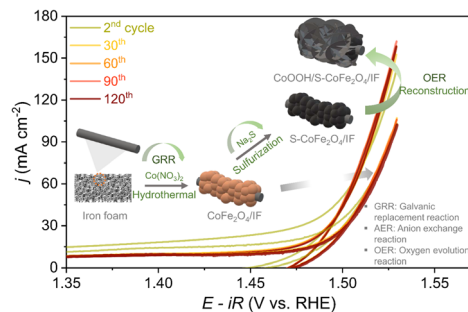
S. Amanda Ekanayake, Aaron Seeber, Joseph F. Olorunyomi, Haoxin Mai, Sanje Mahasivam, Daksh Shah, Junlin Lu, Xiaoming Wen, Nishanthini Sampath, Simon L. Schumann, Nicholas Cox, Dehong Chen\* and Rachel A. Caruso\*



14744

## Water-surface reconstruction of sulfurized spinel-structured oxide oxygen catalysts for alkaline water electrolysis

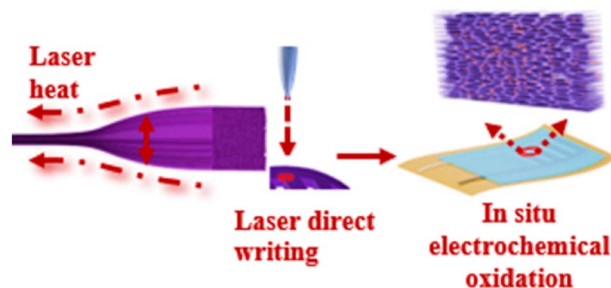
Sungyong Choi, Swetarekha Ram, Sung Ryul Choi, Won Young An, Seojeong Yoo, Seung-Cheol Lee, Satadeep Bhattacharjee\* and Jun-Young Park\*



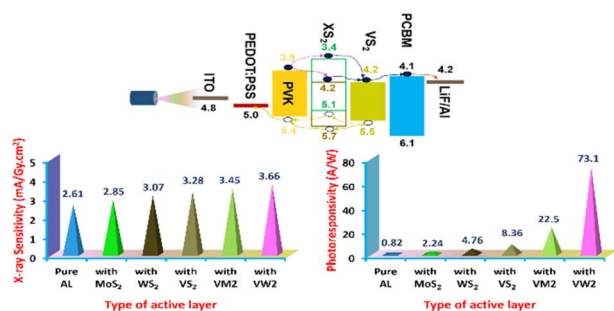
14759

## Laser-assisted fabrication of a 3D cross-linked V<sub>2</sub>CT<sub>x</sub>/rGO microelectrode for high-rate aqueous zinc-ion microbatteries

Jiao Wu, Long Liu, Cai-Yun Ren, Yong-Chao Zhang, Jian Gao\* and Xiao-Dong Zhu\*



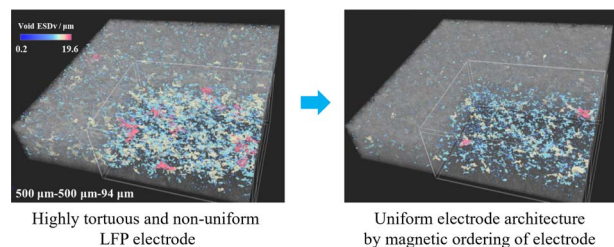
14769



### Assembling highly efficient X-ray and UV-visible light detectors using a VS<sub>2</sub>-MoS<sub>2</sub> and VS<sub>2</sub>-WS<sub>2</sub> hybrid composite-embedded perovskite layer

Dhanasekaran Vikraman, Hailiang Liu, Syed Hassan Abbas Jaffery, Sajjad Hussain, K. Karuppasamy, Duhee Lee, Jungwon Kang, Jongwan Jung and Hyun-Seok Kim\*

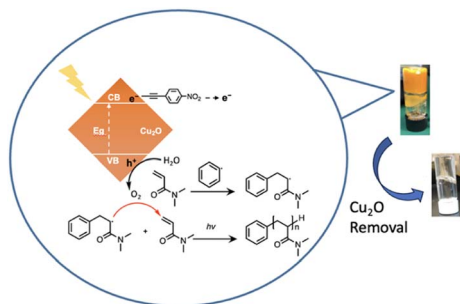
14786



### Modulation of lithium iron phosphate electrode architecture by magnetic ordering for lithium-ion batteries

Wontak Kim, Chihyun Hwang, Yong Min Kim, Ji-Sang Yu, Young-Jun Kim,\* Ki Jae Kim\* and Hyun-seung Kim\*

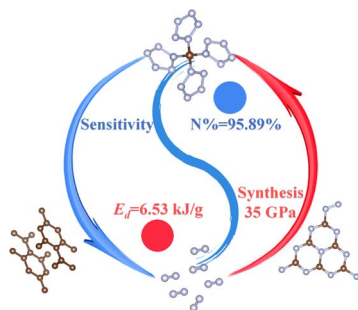
14792



### Photocatalyzed dimethylacrylamide polymerization in an aqueous solution using 4-nitrophenylacetylene-modified Cu<sub>2</sub>O crystals

Yu-Chien Chen, Xing-Fu Huang, Huei-Ting Hsu, Er-Ting Wu, Chi-How Peng\* and Michael H. Huang\*

14801



### Achieving ultrahigh energy density and excellent stability in carbon pentazole

Guanghui Zhang, Wencai Yi,\* Yiqing Cao, Shengli Zhang\* and Xiaobing Liu\*

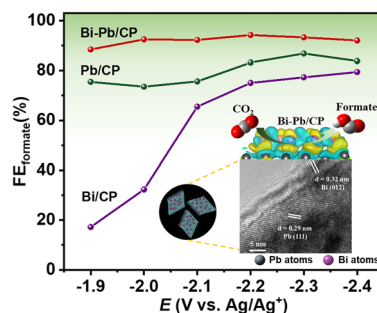


## PAPERS

14809

**Efficient CO<sub>2</sub> electroreduction to formate using Bi–Pb bimetallic catalysts with 2D vertical nanosheets**

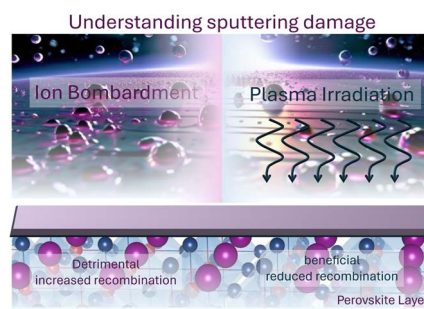
Chongyang Jiang, Shaojuan Zeng,\* Jiaqi Feng, Guilin Li, Bin Hai, Kuilin Peng and Xiangping Zhang\*



14816

**Origin of sputter damage during transparent conductive oxide deposition for semitransparent perovskite solar cells**

Qing Yang, Weiyuan Duan,\* Alexander Eberst, Benjamin Klingebiel, Yueming Wang, Ashish Kulkarni, Andreas Lambertz, Karsten Bittkau, Yongqiang Zhang, Svetlana Vitusevich, Uwe Rau,\* Thomas Kirchartz and Kaining Ding\*



## CORRECTION

14828

**Correction: Interface construction of CuCoSe@NiS based on an ultrathin nanosheet for high-performance supercapacitors**

Wenrui Wu, Yue Yan, Xing Wang, Chengzhi Wei, Yang Yang, Tao Xu and Xianfu Li\*

