

# Journal of Materials Chemistry A

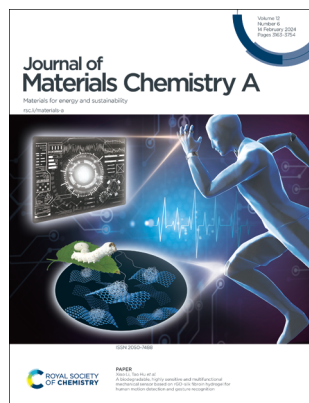
Materials for energy and sustainability

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ISSN 2050-7488 CODEN JMCAET 12(6) 3163–3754 (2024)



### Cover

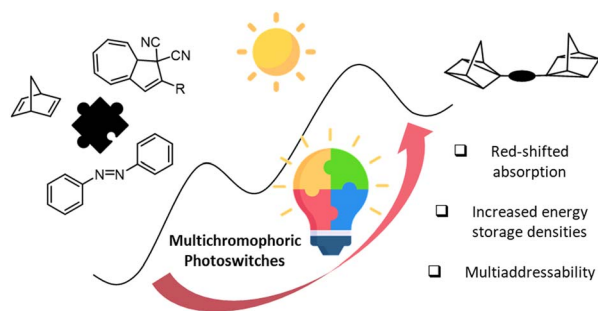
See Xiao Li, Tao Hu *et al.*, pp. 3283–3293. Image reproduced by permission of Xiao Li from *J. Mater. Chem. A*, 2024, 12, 3283.

## REVIEWS

3180

### Multichromophoric photoswitches for solar energy storage: from azobenzene to norbornadiene, and MOST things in between

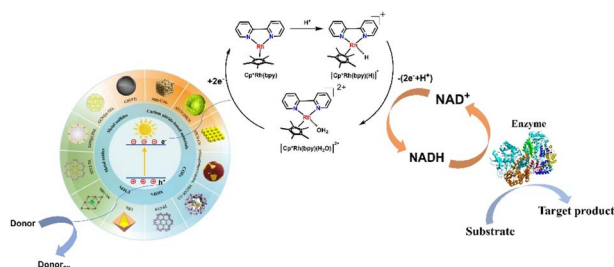
Rebecca J. Salthouse and Kasper Moth-Poulsen\*



3209

### Recent advances in porous materials for photocatalytic NADH regeneration

Gaozhen Zhao, Chonghui Yang, Wu Meng\* and Xiaowen Huang\*



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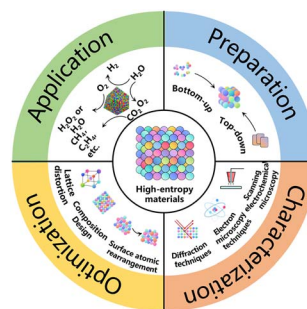
**Fundamental questions  
Elemental answers**

## REVIEWS

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### Progresses on high-entropy nano-catalysts for electrochemical energy conversion reactions

Lihua Zhang, Tong Wu, Yinbo Zhan, Yilin Dong, Fei Wei, Dongliang Zhang, Bowei Zhou, Zheng Tan, Changying Zhao and Xia Long\*

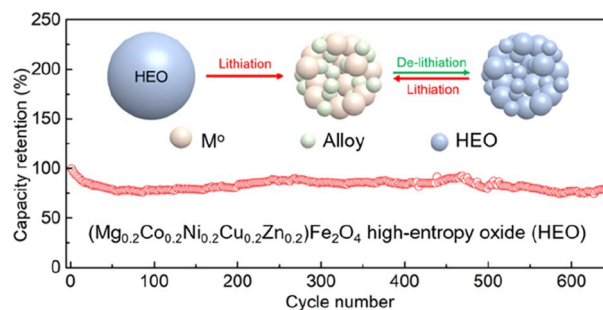


## COMMUNICATIONS

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### Synthesis of spinel $(\text{Mg}_{0.2}\text{Co}_{0.2}\text{Ni}_{0.2}\text{Cu}_{0.2}\text{Zn}_{0.2})\text{Fe}_2\text{O}_4$ in seconds for lithium-ion battery anodes

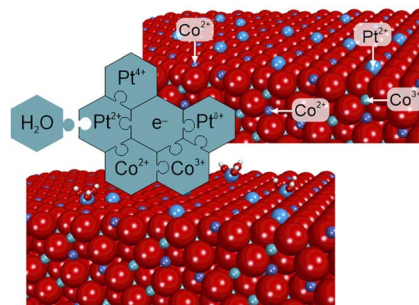
Ruiqi Ren, Dixian Wu, Jingyuan Zhang, Xiangyu You, Zikang Xu, Jinyao Yang, Hang Ren, Guoyin Zhu, Yizhou Zhang and Shengyang Dong\*



3258

### Atomistic picture of electronic metal support interaction and the role of water

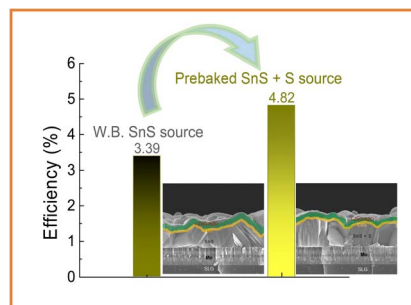
Lukáš Fusek, Matteo Farnesi Camellone, Michal Ronovský, Maximilian Kastenmeier, Tomáš Skála, Pankaj Kumar Samal, Nataliya Tsud, Sascha Mehl, Jan Škvára, Tomáš Dolák, Vitalii Uvarov, Martin Setvín, Viktor Johánek, Stefano Fabris, Olaf Brummel, Jörg Libuda, Josef Mysliveček,\* Simone Piccinin\* and Yaroslava Lykhach\*



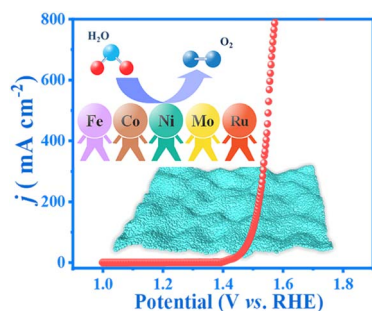
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### Prebaking of an SnS source with sulfur for achieving higher photovoltaic performance in VTD-SnS thin films for solar cells

Rahul Kumar Yadav, Pravin S. Pawar, Yong Tae Kim, Indu Sharma and Jaeyeong Heo\*



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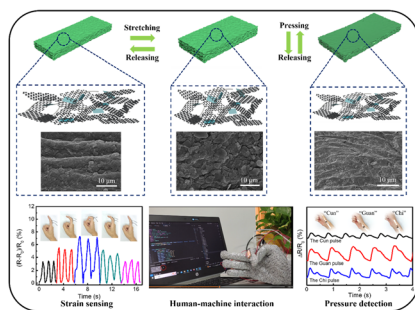


### Rapid, self-sacrificing template synthesis of two dimensional high-entropy oxides toward high-performance oxygen evolution

Xiaofeng Tian, Hongdong Li,\* Rui Chang, Yu Yang, Zhenhui Wang, Tian Dong, Jianping Lai, Shouhua Feng and Lei Wang\*

## PAPERS

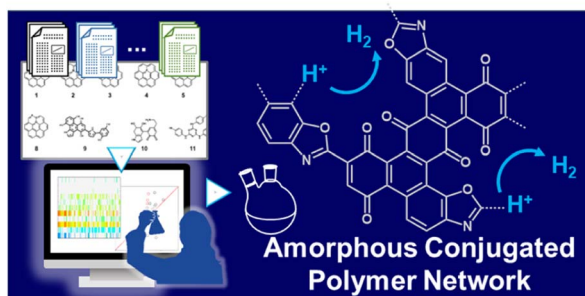
3283



### A biodegradable, highly sensitive and multifunctional mechanical sensor based on rGO-silk fibroin hydrogel for human motion detection and gesture recognition

Ke Chen, Baoyang Liu, Ning Hu, Qiaolin Fan, Fawang Zhan, Zhou Zhang, Zhonghua Ni, Xiao Li\* and Tao Hu\*

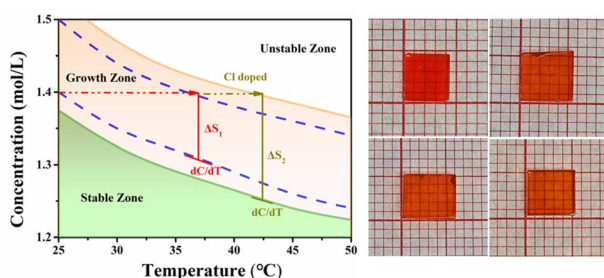
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### Efficient design and synthesis of an amorphous conjugated polymer network for a metal-free electrocatalyst of hydrogen evolution reaction

Wakana Hamada, Mafumi Hishida, Ryuto Sugiura, Haruka Tobita, Hiroaki Imai, Yasuhiko Igarashi and Yuya Oaki\*

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### Single nucleation of Cl-doped FAPbBr₃ with inhibited ion migration for ambipolar radiation detection

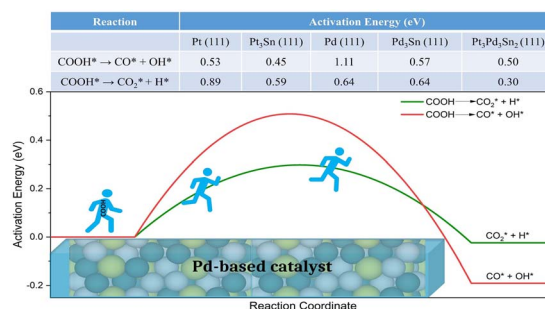
Quanchao Zhang, Xin Liu,\* Xin Zhang, Zijian Wang, Baoqiang Zhang, Yingying Hao, Alain Dubois, Wanqi Jie and Yadong Xu\*



3311

## The origins of formic acid electrooxidation on selected surfaces of Pt, Pd, and their alloys with Sn

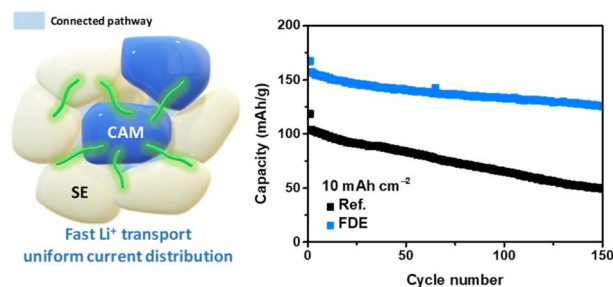
Radhey ShyamYadav, Medhanie Gebremedhin Gebru, Hanan Teller, Alex Schechter and Haya Kornweitz\*



3323

## Boosting the electrochemical performance with functionalized dry electrodes for practical all-solid-state batteries

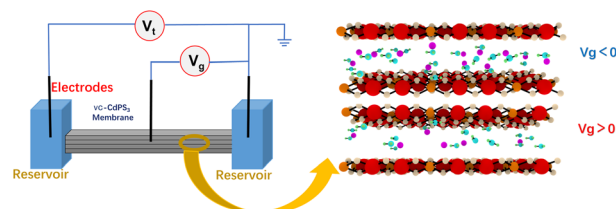
Dongsoo Lee and Arumugam Manthiram\*



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## Nanofluidic ion regulation membranes based on two-dimensional vacancy-containing CdPS<sub>3</sub> membrane

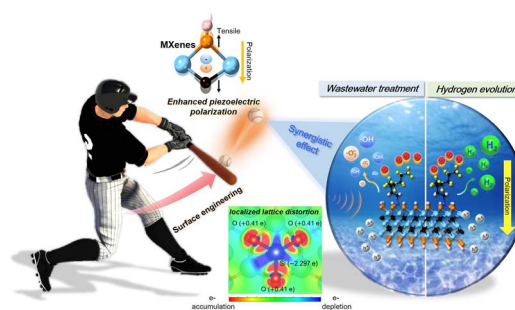
Meng Zhang, Chenhui Huang, Zhaofeng Zhai, Xiaomin Kang, Jiang Ju\* and Xitang Qian\*



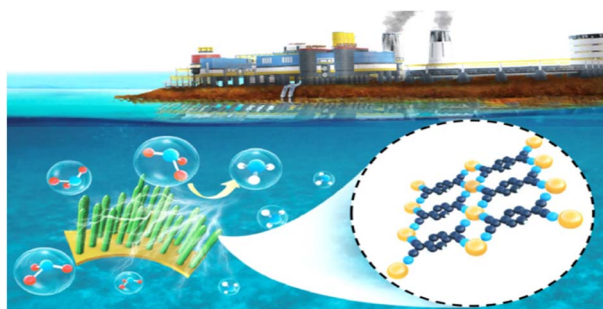
3340

## An ultraefficient surface functionalized Ti<sub>3</sub>C<sub>2</sub>T<sub>x</sub> MXene piezocatalyst: synchronous hydrogen evolution and wastewater treatment

Sz-Nian Lai, Winston Yenyu Chen, Chao-Chun Yen, Yin-Song Liao, Po-Han Chen, Lia Stanciu and Jyh Ming Wu\*



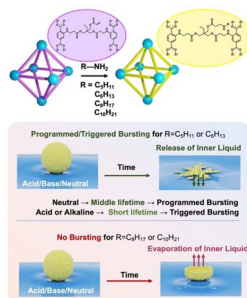
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### Fe(TCNQ)<sub>2</sub> nanorod arrays: an efficient electrocatalyst for electrochemical ammonia synthesis via the nitrate reduction reaction

Nilmadhab Mukherjee, Ashadul Adalder, Narad Barman, Ranjit Thapa, Rajashri Urkude, Biplab Ghosh and Uttam Kumar Ghorai\*

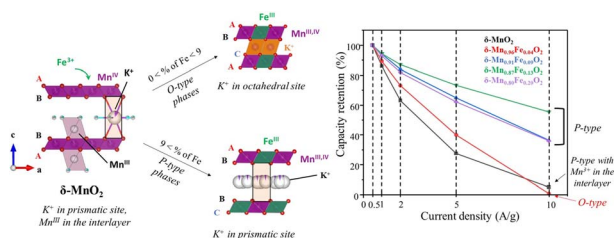
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### pH-triggered adjustable bursting of liquid marbles in water pools

Saurav Kumar, Nishanta Barman, Angana Borbora, Priyam Mondal, Mizuki Tenjimbayashi\* and Uttam Manna\*

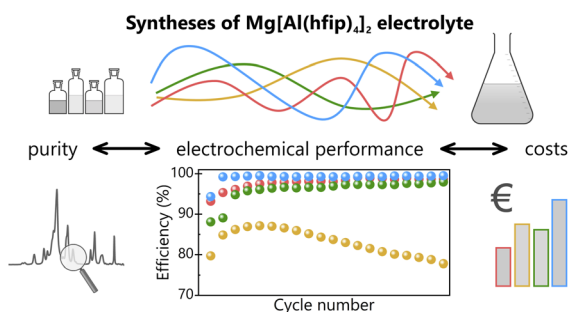
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### Incorporation of Fe<sup>3+</sup> into MnO<sub>2</sub> birnessite for enhanced energy storage: impact on the structure and the charge storage mechanisms

Ronan Invernizzi, Vadim M. Kovrugin, Louise Molinié, Antonella Iadecola, Mathieu Duttine, Lydie Bourgeois, Jacob Olchowka\* and Liliane Guerlou-Demourgues\*

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### Evaluating the synthesis of Mg[Al(hfip)<sub>4</sub>]<sub>2</sub> electrolyte for Mg rechargeable batteries: purity, electrochemical performance and costs

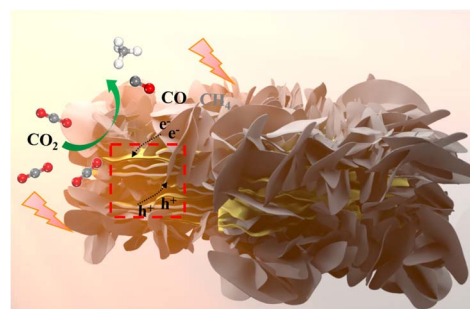
Tjaša Pavčnik, Jernej Imperl, Mitja Kolar, Robert Dominko and Jan Bitenc\*



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### Synergistic mediation of dual donor levels in CNS/BOCB-OV heterojunctions for enhanced photocatalytic CO<sub>2</sub> reduction

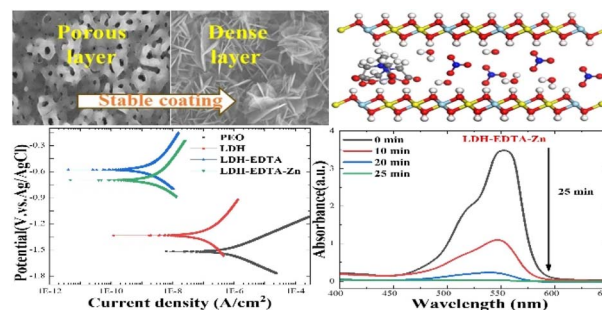
Ruiming Fang, Zhongqing Yang,\* Jiajun Sun, Chenxuan Zhu, Yanglin Chen, Ziqi Wang and Can Xue\*



3411

### Modulating chelation with pH sensitivity for controlled structural defects and enhanced electrochemical and photocatalytic activities of LDH films

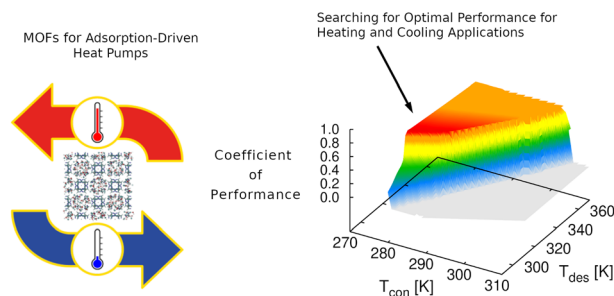
Muhammad Ali Khan, Ananda Repycha Safira and Mosab Kaseem\*



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### Alcohol-based adsorption heat pumps using hydrophobic metal-organic frameworks

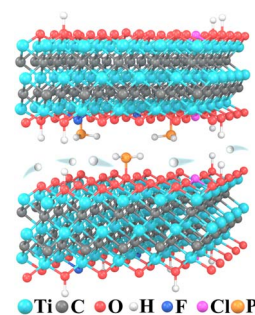
R. M. Madero-Castro, A. Luna-Triguero, C. González-Galán, José Manuel Vicent-Luna\* and Sofía Calero\*



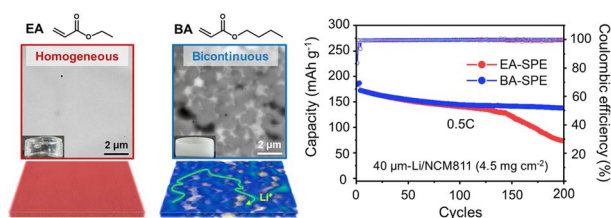
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### Selective grafting of phosphorus onto Ti<sub>3</sub>C<sub>2</sub>T<sub>x</sub> MXene enables a two-proton process and enhanced charge storage

Hao Li, Ke Fan, Pei Xiong, Hanmo Zhou, Zezhou Lin, Keyu Tao, Tiancheng Liu, Xuyun Guo, Ye Zhu, Lyuchao Zhuang, Wei Han, Chen Yang, Yan Liu, Molly Meng-Jung Li,\* Mingwang Fu, John Wang and Haitao Huang\*



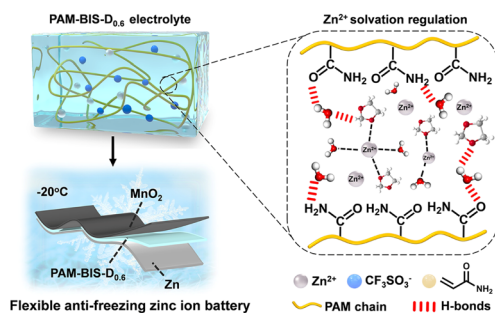
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### Tuning phase structures of *in situ* polymerized elastomeric electrolytes via monomer structure engineering for achieving high stability in solid-state lithium metal batteries

Seung Ho Kwon, Michael J. Lee, Junghun Han, Ju Hong Min, Seongmin Kim, Se Young Kim, Jinseok Park, Eunji Lee,\* Seung Woo Lee\* and Bumjoon J. Kim\*

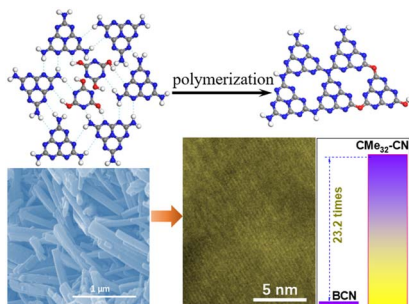
3470



### Organohydrogel electrolytes with solvated structure regulation for highly reversible low-temperature zinc metal batteries

Feng Zhang, Mingchen Yang, Pengda Fang, Jiangtao Yu, Xinyu Ma, Yin Hu\* and Feng Yan\*

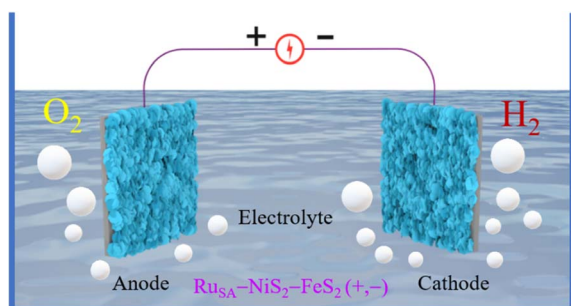
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### Crystalline oxygen-bridged carbon nitride from self-assembled supramolecular intermediate for efficient photocatalytic H<sub>2</sub> evolution

Guangzheng Huang, Bowen Xiao, Liyan Bao, Dengke Wang, Yannan Luo, Shicheng Yan\* and Honglin Gao\*

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### Ruthenium single atoms implanted on NiS<sub>2</sub>-FeS<sub>2</sub> nanosheet heterostructures for efficacious water electrolysis

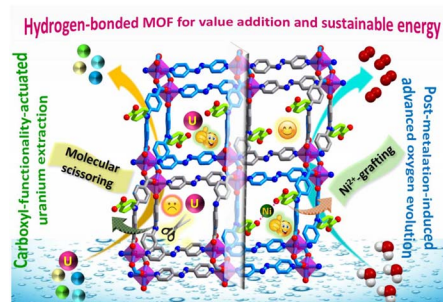
Ram Babu Ghising, Uday Narayan Pan, Mani Ram Kandel, Purna Prasad Dhakal, Saleem Sidra, Do Hwan Kim, Nam Hoon Kim\* and Joong Hee Lee\*



3501

### Pendent carboxylic acid-fuelled high-performance uranium extraction in a hydrogen-bonded framework and prolifically improved water oxidation via post-metalation-actuated composite fabrication

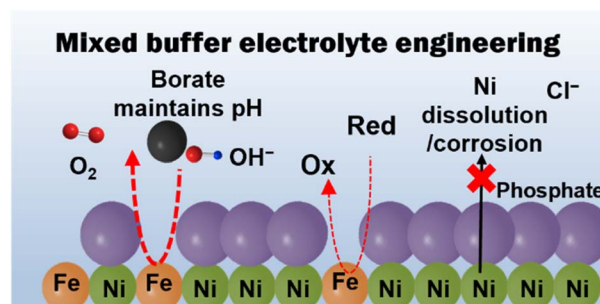
Nilanjan Seal,\* Arun Karmakar, Subrata Kundu\* and Subhadip Neogi\*



3513

### Dynamic stabilization of nickel-based oxygen evolution electrocatalysts in the presence of chloride ions using a phosphate additive

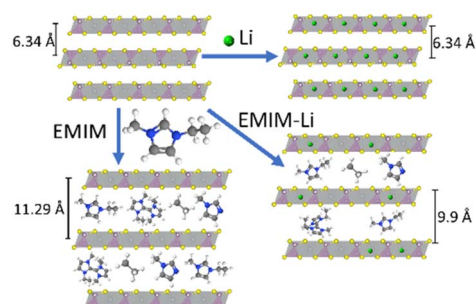
Hiroki Komiya, Keisuke Obata, Tetsuo Honma and Kazuhiro Takanabe\*



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### Charge compensation in a layered van der Waals NiPS<sub>3</sub> host through various cationic intercalations

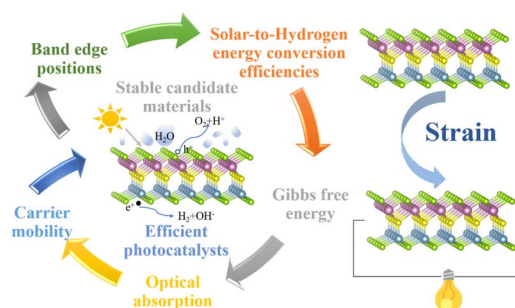
Sebastian Pazek, Anna Efimenko, Roberto Félix, Maria Roslova, Christine Joy Querebillo, Mikhail V. Gorbunov, Alexander Ovchinnikov, Andreas Koitzsch, Carlos Escudero, Yulia Shemerliuk, Saicharan Aswartham, Bernd Büchner, Ahmad Omar\* and Daria Mikhailova\*



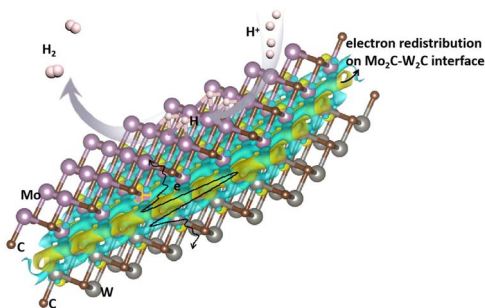
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### Two-dimensional Janus chalcogenides: candidates for efficient photocatalysts and piezoelectric materials

Chenchen Qi, Cuixia Yan,\* Qiuyang Li, Ting Yang, Shi Qiu and Jinming Cai\*



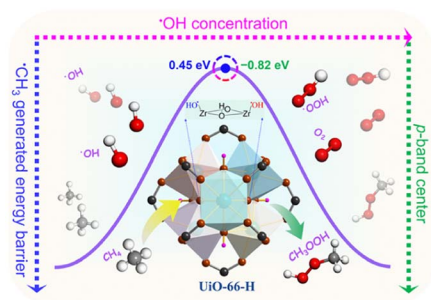
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### Boosting electrocatalytic hydrogen evolution over a Mo<sub>2</sub>C–W<sub>2</sub>C heterostructure by interface-induced electron modulation

Lijuan Jiang, Ruijing Wang, Huimin Zhou, Guang-Feng Wei\* and Xuefeng Wang\*

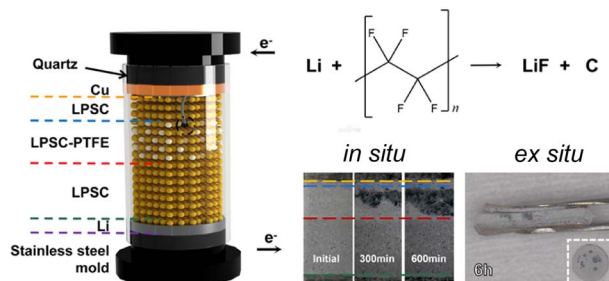
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### Deciphering structural evolution of adsorbed $\cdot\text{OH}$ species on Zr-oxo nodes of UiO-66 to modulate methane hydroxylation

Ling-Chan Tian, Geqian Fang, Yun Zhou, Wenjun Yu, Lin Li, Jin-Nian Hu, Haiyan Wang, Jin-Xia Liang,\* Chun Zhu,\* Xiaodong Wang and Jian Lin\*

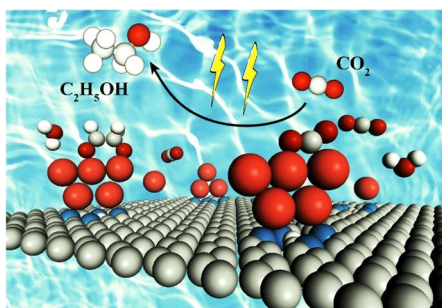
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### Dendrite growth and inhibition in all-solid-state lithium metal batteries: *in situ* optical observation

Haowen Liu, Weining Jiang, Wenjie Chen, Qiyuan Lin, Shuaiyang Ren, Yipeng Su, Ruoyu Tong and Yuegang Zhang\*

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### The activity origin of C–N–Cu electrocatalysts for ethanol formation in the CO<sub>2</sub> reduction reaction under working conditions

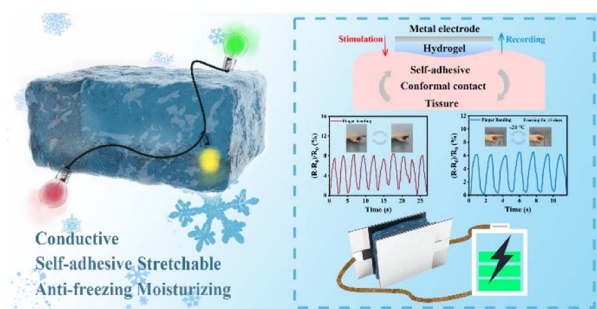
Xiaotao Zhang, Jiao Chen, Guoying Gao,\* Hongyan Wang, Yongliang Tang, Bai Sun,\* Yuxiang Ni, Yuanzheng Chen\* and Yuan Ping Feng



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### Multifunctional conductive hydrogels for wearable sensors and supercapacitors

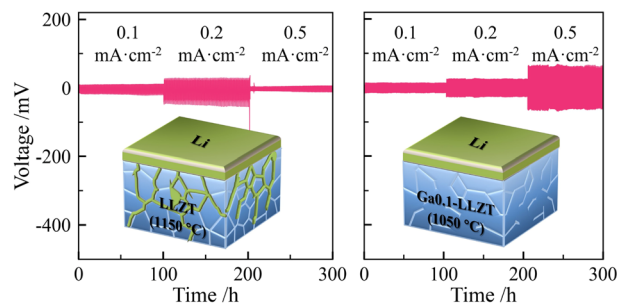
Quancai Li, Bin Tian,\* Guilin Tang, Haoye Zhan, Jing Liang,\* Panwang Guo, Qun Liu and Wei Wu\*



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### Improvement of the Li-ion conductivity and air stability of the Ta-doped $\text{Li}_7\text{La}_3\text{Zr}_2\text{O}_{12}$ electrolyte via Ga co-doping and its application in Li-S batteries

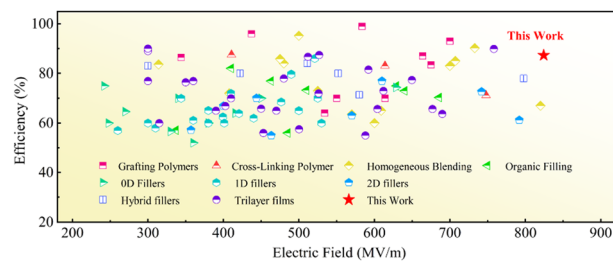
Kai Ma, Bowen Chen, Cheng-Xin Li\* and Venkataraman Thangadurai\*



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### Optimizing the gradient of electric field distribution and inhibiting charge injection in multilayer dielectric films for high capacitive performance

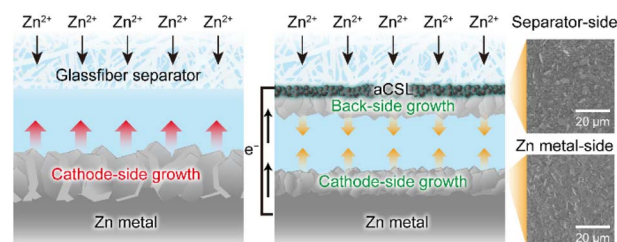
Zhicheng Li, Yu Zhang, Zhongbin Pan,\* Xu Fan, Peng Li, Haiming Huang,\* Weiliang Wang, Weidong Chen, Jinjun Liu and Weiping Li\*



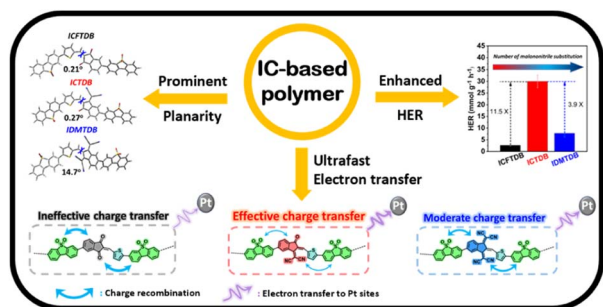
3623

### A hydrophilic Janus-faced separator with functionalized nanocarbon for stable cycling of aqueous Zn-metal batteries

Hyuntae Lee, Jiwoong Kang, Ho Won Kang, Mingyu Lee, Jaewoong Han, Minhong Lim, Jaeho Lee, Woosuck Kwon, Dae-Hyun Nam, Byung Gon Kim\* and Hongkyung Lee\*



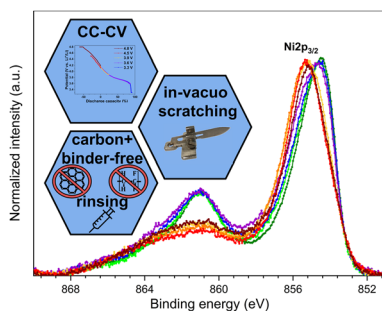
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### Indanone-based conjugated polymers enabling ultrafast electron transfer for visible light-driven hydrogen evolution from water

Tse-Fu Huang, Ying-Rang Zhuang, Chih-Li Chang, Ching-Li Huang, Wei-Cheng Lin, Zi-Cheng Jiang, Li-Yu Ting, Islam M. A. Mekhmer, Yu-En Sun, Pinit Kidkhunthod, Jeng-Lung Chen, Yi-Chan Huang, Hung-Kai Hsu, Yuan-Ting Tseng, Yi-Hsiang Wu, Bing-Heng Li, Shang-Da Yang, Yen-Ju Cheng and Ho-Hsiu Chou\*

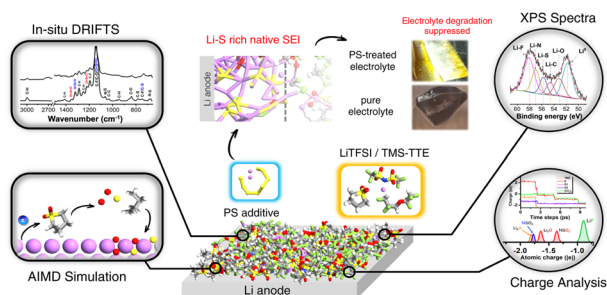
3644



### Voltage-dependent charge compensation mechanism and cathode electrolyte interface stability of the lithium-ion battery cathode materials $\text{LiCoO}_2$ and $\text{LiNi}_{1/3}\text{Mn}_{1/3}\text{Co}_{1/3}\text{O}_2$ studied by photoelectron spectroscopy

Maximilian Mellin, Gennady Cherkashinin, Elham Mohseni, Robert Phillips, Wolfram Jaegermann\* and Jan P. Hofmann\*

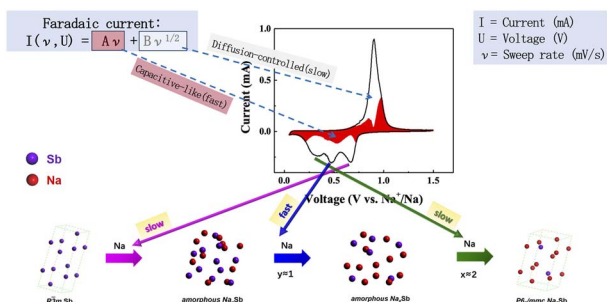
3659



### Understanding the formation chemistry of native solid electrolyte interphase over lithium anode and its implications using a LiTFSI/TME-TTE electrolyte and polysulfide additive

Bikila Nagasa Olana, Shih-Huang Pan, Bing-Joe Hwang, Holger Althues, Jyh-Chiang Jiang and Shawn D. Lin\*

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### Understanding the fast kinetics and mechanism of sodium storage in antimony using *ab initio* grand canonical Monte Carlo simulation and *operando* X-ray scattering

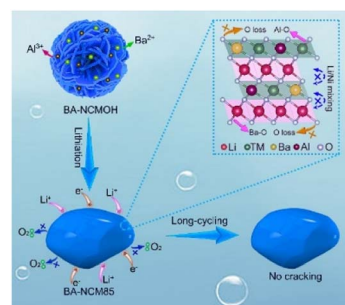
Manni Li, Tian Qiu, Samuel S. Welborn, Alexandre C. Foucher, Jintao Fu, Benjamin K. Lesel, Zeyu Wang, Lin Wang, Eric A. Stach, Andrew M. Rappe\* and Eric Detsi\*



3682

## Enhanced Li-ion intercalation kinetics and lattice oxygen stability in single-crystalline Ni-rich Co-poor layered cathodes

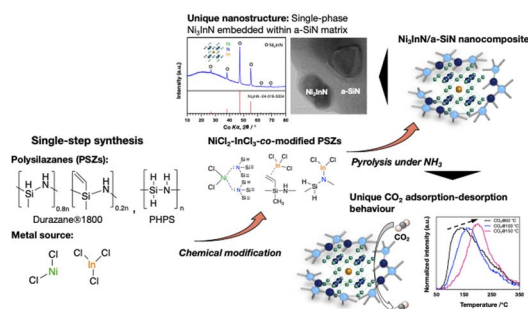
Hujun Zhang, Li Qin, Michal Sedlacik, Petr Saha, Qilin Cheng,\* Haifeng Yu\* and Hao Jiang



3689

## An *in situ* growth route towards anti-perovskite Ni<sub>3</sub>InN nanoparticles embedded within amorphous silicon nitride

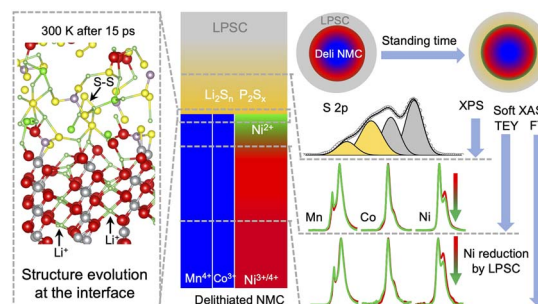
Shotaro Tada, Sakurako Takazawa, Norifumi Asakuma, Maxime Cheype, Sawao Honda, Ravi Kumar, Samuel Bernard and Yuji Iwamoto\*



3700

## Interfacial degradation of the NMC/Li<sub>6</sub>PS<sub>5</sub>Cl composite cathode in all-solid-state batteries

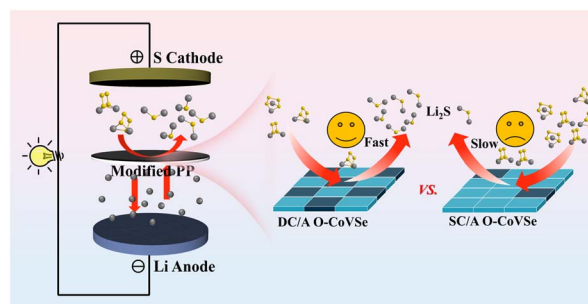
Xudong Hu, Zishuo Zhao, Yang Zhao, Xuelong Wang, Sami Sainio, Dennis Nordlund, Cristina M. Ruse, Xiao-Dong Zhou, Shannon W. Boettcher, Dong Hou,\* Qi-Jun Hong\* and Linqin Mu\*



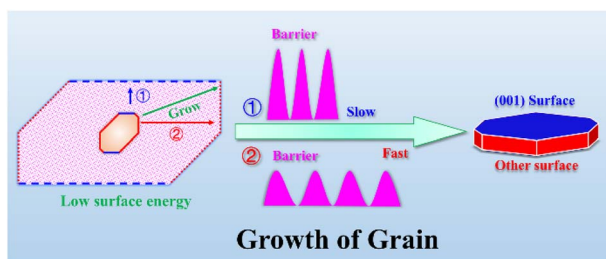
3711

## Oxygen-incorporated crystalline/amorphous heterophase cobalt vanadium selenide nanoplates with dense interfacial sites for robust lithium-sulfur batteries

Pengcheng Tan, Yuan Yin, Daoping Cai,\* Ban Fei, Chaoqi Zhang, Qidi Chen\* and Hongbing Zhan



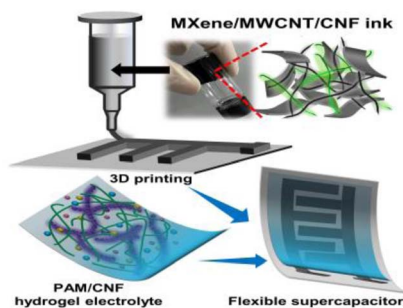
3722



### The grain morphology and surface properties of a Li-rich $\text{Li}_2\text{MnO}_3$ cathode material: a first-principles study

Xiaotong Yan, Xingyu Zhou, Chunwei Zhu, Weijie Huang and Yu-Jun Zhao\*

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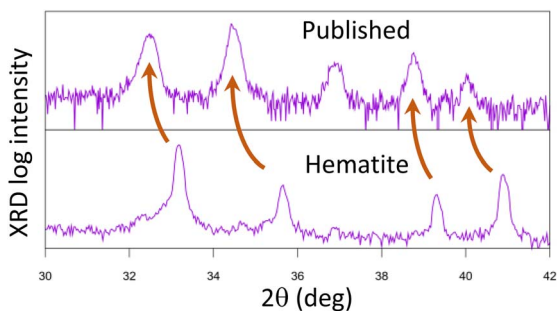


### 3D printed MXene-based films and cellulose nanofiber reinforced hydrogel electrolyte to enable high-performance flexible supercapacitors

Guoqiang Zhou, Xinyue Liu, Chaozheng Liu, Zhenglin Li, Chuhan Liu, Xiaojie Shi, Ziyang Li, Changtong Mei\* and Mei-Chun Li\*

## COMMENTS

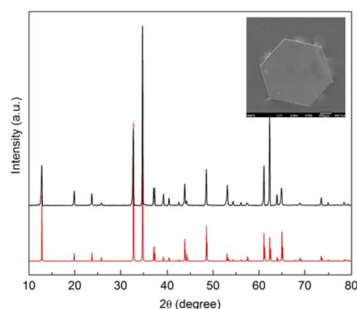
3745



### Comment on "A $\text{K}_2\text{Fe}_4\text{O}_7$ superionic conductor for all-solid-state potassium metal batteries", by H. Yuan *et al.*, *J. Mater. Chem. A*, 2018, 6, 8413–8418

Doriano Brogioli, Michele Tribbia, Michael Gockeln, Jens Glenneberg, Julian Schwenzel and Fabio La Mantia

3748



### Reply to the 'Comment on "A $\text{K}_2\text{Fe}_4\text{O}_7$ superionic conductor for all-solid-state potassium metal batteries"', by D. Brogioli, M. Tribbia, M. Gockeln, J. Glenneberg, J. Schwenzel and F. LaMantia, *J. Mater. Chem. A*, 2023, 11, <https://doi.org/D3TA01240A>

Hongming Yuan,\* He Li, Tingsong Zhang and Guanghua Li



## CORRECTIONS

3750

**Correction: The origins of formic acid electrooxidation on selected surfaces of Pt, Pd, and their alloys with Sn**

Radhey Shyam Yadav, Medhanie Gebremedhin Gebru, Hanan Teller, Alex Schechter and Haya Kornweitz\*

3751

**Correction: Improving the performance of a SnS<sub>2</sub> cathode with interspace layer engineering using a Na<sup>+</sup> insertion/extraction method for aqueous zinc ion batteries**

Ali Molaei Aghdam,\* Nima Mikaeili Chahartagh, Shahriar Namvar, Mahshid Ershadi, Farshad Boorboor Ajdari\* and Ehsan Delfani

