

# Journal of Materials Chemistry A

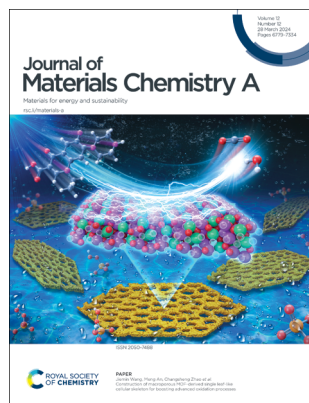
Materials for energy and sustainability

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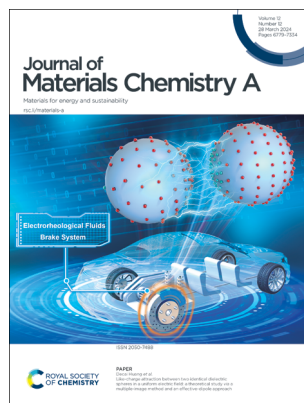
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ISSN 2050-7488 CODEN JMCAET 12(12) 6779–7334 (2024)



### Cover

See Jiemin Wang, Meng An, Changsheng Zhao *et al.*, pp. 6885–6895. Image reproduced by permission of Jiemin Wang from *J. Mater. Chem. A*, 2024, 12, 6885.



### Inside cover

See Decai Huang *et al.*, pp. 6896–6905. Image reproduced by permission of Decai Huang from *J. Mater. Chem. A*, 2024, 12, 6896.

## EDITORIAL

6795

### Introduction to emerging materials for solar energy harvesting

Joel M. R. Tan, Frank E. Osterloh and Lydia Wong\*

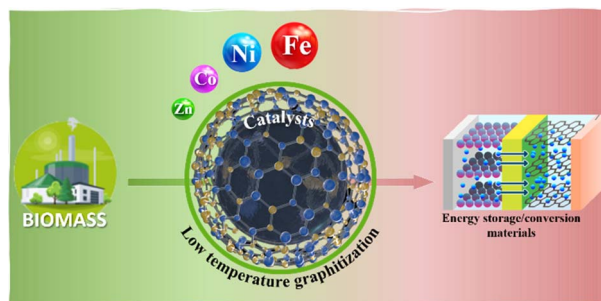


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### Probing the evolution in catalytic graphitization of biomass-based materials for enduring energetic applications

Mehdi Mennani,\* Anass Ait Benhamou, Ayoub Abdelkader Mekkaoui, Fatima El Bachraoui, Mounir El Achaby, Amine Moubarik and Zineb Kassab\*



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Elemental answers

## REVIEWS

6826

**Wearable flexible pressure sensors: an intriguing design towards microstructural functionalization**

Yanru Li, Dawei Jiang,\* Yulong An, Wenshuai Chen, Zhanhua Huang\* and Bo Jiang\*

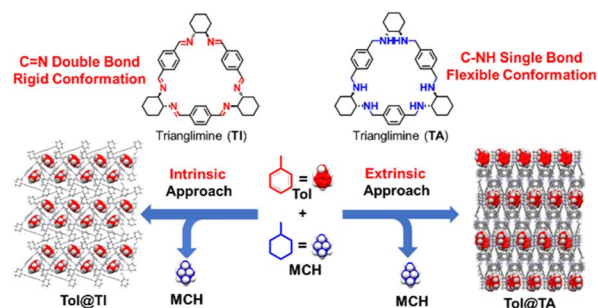


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**Adsorptive molecular sieving of aromatic hydrocarbons over cyclic aliphatic hydrocarbons via an intrinsic/extrinsic approach**

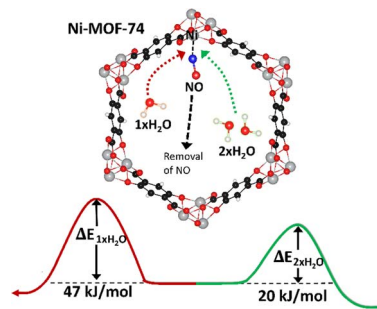
Gengwu Zhang, Xuanfu Zhu, Lukman O. Alimi, Xin Liu, Aiping Chen, Basem M. Moosa and Niveen M. Khashab\*



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**Real-time observation of the exchange process between H<sub>2</sub>O and NO in the metal–organic framework Ni-MOF-74**

Haardik Pandey, Hao Wang, Monica Vasquez Alfaro, Jing Li, Timo Thonhauser\* and Kui Tan\*

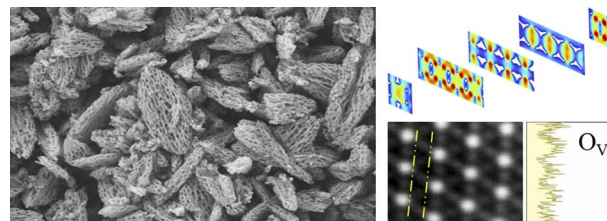


## PAPERS

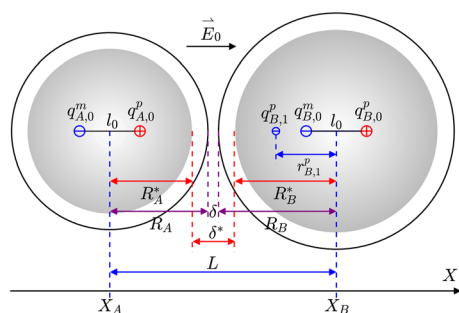
6885

**Construction of macroporous MOF-derived single leaf-like cellular skeleton for boosting advanced oxidation processes**

Jiemin Wang,\* Wenkai Xiao, Xu Wang, Xuhui Sun, Meng An\* and Changsheng Zhao\*



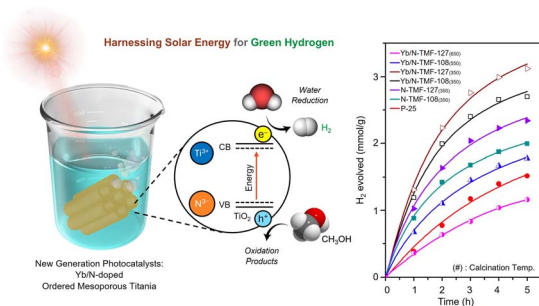
6896



## Like-charge attraction between two identical dielectric spheres in a uniform electric field: a theoretical study via a multiple-image method and an effective-dipole approach

Xin Li, Changhao Li, Xin Gao and Decai Huang\*

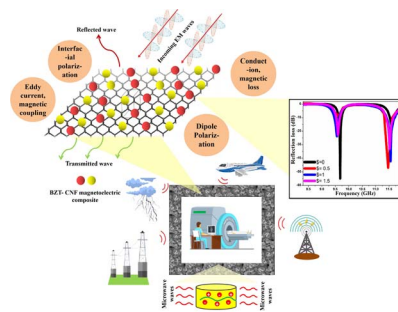
6906



## Ytterbium–nitrogen co-doped ordered mesoporous TiO<sub>2</sub>: an innovative hetero-phase photocatalyst for harnessing solar energy in green hydrogen production

Sanjeev Gupta, Yeonsu Kwak, Rayappan Pavul Raj and Parasuraman Selvam\*

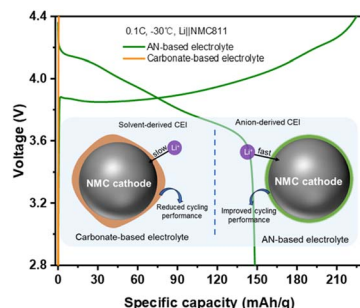
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## A graphene oxide decorated BZT–CNF composite through hybrid microwave processing: an advanced multifunctional material for superior microwave shielding applications

Chinmay Chandan Parhi, Avanish Babu Thirumalasetty, Ajit Raymond James, Yogesh Kumar Choukiker and Madhuri Wuppulluri\*

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## Regulating the solvation structure of an acetonitrile-based electrolyte for Li/NMC811 batteries cycled at low temperature

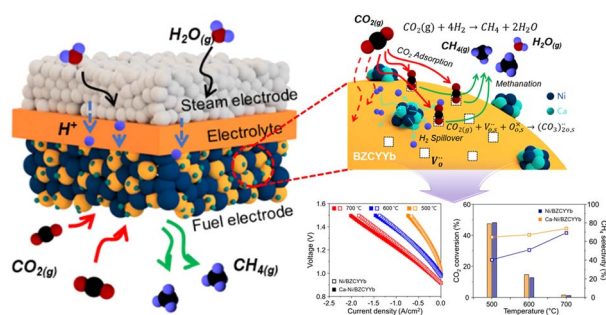
Lin Liu, Zulipiya Shadike,\* Xinyin Cai, Mengwei Hong, Yue Gao, Shuiyun Shen and Junliang Zhang\*



6955

### Engineering the heterogeneous catalyst of protonic ceramic electrochemical cells for CO<sub>2</sub>/H<sub>2</sub>O co-electrolysis

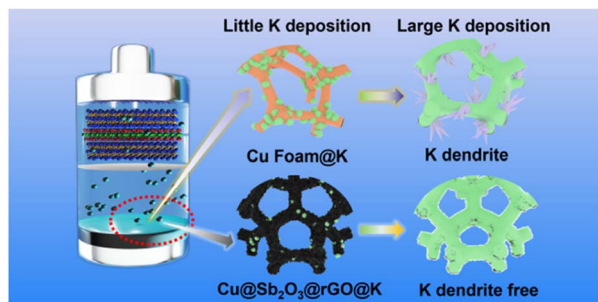
Mingi Choi, Donguk Kim, Cheong Beom Lee, Jongmin Baek, Sehee Bang, Yuhan Jung, Kyungpyo Hong, Jongsup Hong, Di Chen, Kyeounghak Kim\* and Wonyoung Lee\*



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### Synergy of Cu-foam/Sb<sub>2</sub>O<sub>3</sub>/rGO for stable potassium anodes of high-rate and low-temperature potassium metal batteries

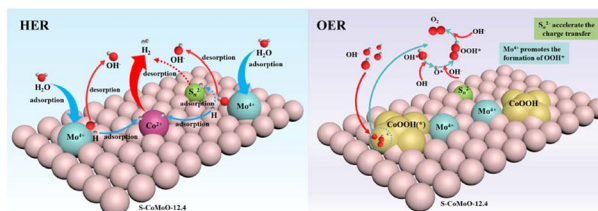
Jing Qi, Chengkai Lin, Shuqi Deng, Yinze Zuo, Hui Zheng, Xuechao Jiao, Wei Yan\* and Jiujun Zhang\*



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### Sulfur-doped cobalt molybdenum oxide with a hydrangea-like structure for bi-functionally efficient overall water splitting

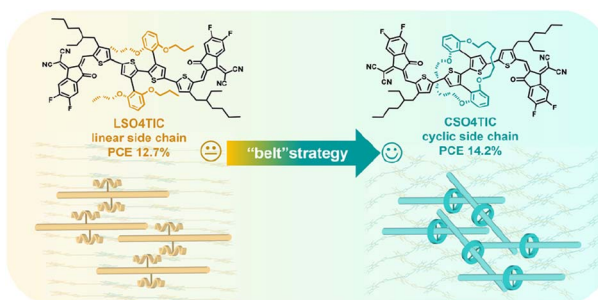
Jie Dong, Saiyi Chen, Cuncai Lv, Mark G. Humphrey, Chi Zhang\* and Zhipeng Huang\*



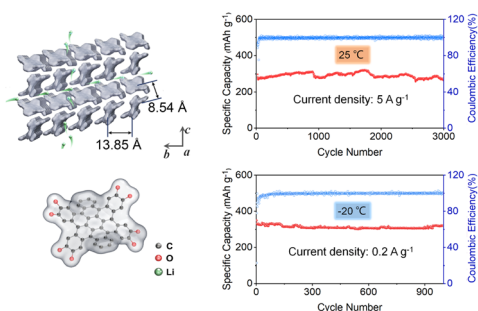
6996

### A "belt" strategy for promoting the 3D network packing of fully non-fused ring acceptors in organic solar cells

Tianqiang Cui, Zhan Huang, Yamin Zhang,\* Xiao-Peng Ru, Xingqi Bi, Yun-Tao Ding, Yongrui Yang, Junpeng Dai, Guanghao Lu, Zitong Liu, Yongsheng Chen\* and Hao-Li Zhang\*



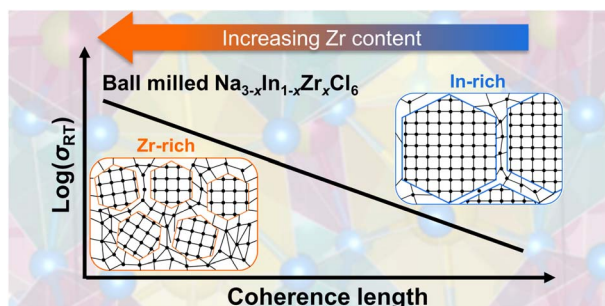
7005



### Herringbone packed contorted aromatics with ordered three-dimensional channels as fast-charging and low-temperature lithium-ion battery anodes

Lei Yang, Xin Zhu, Qinghai Zhou, Chaoran Qi, Qiyu Wang, Fengchun Shi, Meng Zhu, Guorong Chen, Dongdong Wang, Xiaoyan Liu,\* Liwei Wang,\* Dongsong Zhang,\* Hexing Li\* and Shengxiong Xiao\*

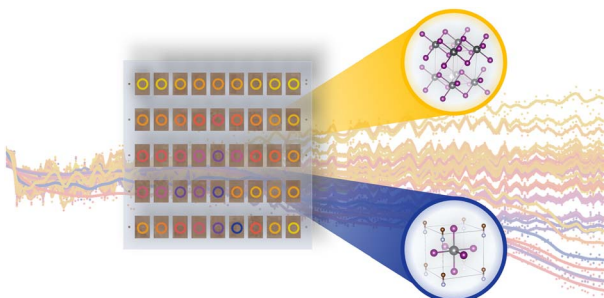
7015



### On the influence of the coherence length on the ionic conductivity in mechanochemically synthesized sodium-conducting halides, $\text{Na}_{3-x}\text{In}_{1-x}\text{Zr}_x\text{Cl}_6$

Tong Zhao, Alexander N. Sobolev, Xabier Martinez de Irujo Labalde, Marvin A. Kraft and Wolfgang G. Zeier\*

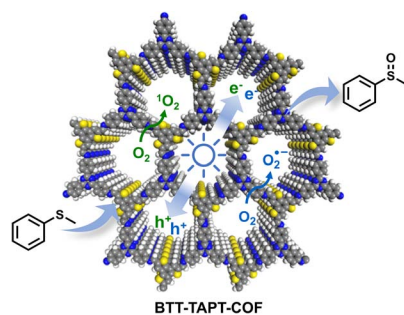
7025



### Advancing high-throughput combinatorial aging studies of hybrid perovskite thin films via precise automated characterization methods and machine learning assisted analysis

Alexander Wiczorek, Austin G. Kuba, Jan Sommerhäuser, Luis Nicklaus Caceres, Christian M. Wolff\* and Sebastian Ioi\*

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### Imine-linked 2D covalent organic frameworks based on benzotrithiophene for visible-light-driven selective aerobic sulfoxidation

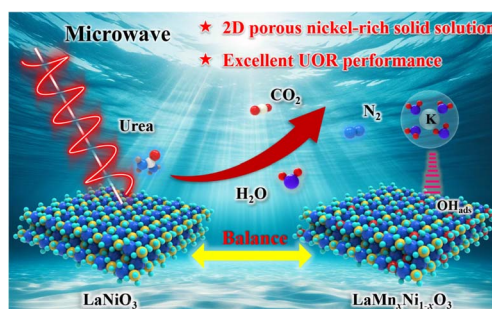
Fengwei Huang, Yuexin Wang, Xiaoyun Dong and Xianjun Lang\*



7047

### Microwave-pulse synthesis of tunable 2D porous nickel-rich solid solution for efficient electrocatalytic urea oxidation

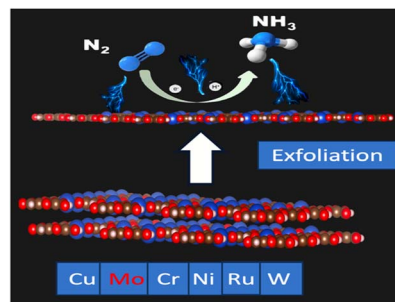
Zhiao Wu, Jinglin Xian, Jiao Dai, Guangyu Fang, Miao Fan, Haoran Tian, Jiayue Guo, Zhenhui Huang, Huiyu Jiang, Weilin Xu and Jun Wan\*



7058

### A Mo–salicylaldehyde-linker (Mo–Tp) based 2D MOF as a single-atom catalyst for the nitrogen reduction reaction

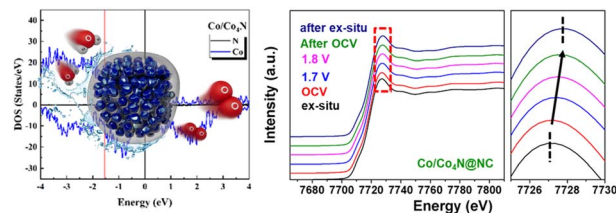
Hassan A. Alhadidi Almheiri, Nirpendra Singh, Dinesh Shetty,\* Kyriaki Polychronopoulou and Ali A. Alhammadi\*



7067

### Tracking accelerated oxygen evolution reaction enabled by explosive reconstruction of active species based on Co<sub>x</sub>N@NC

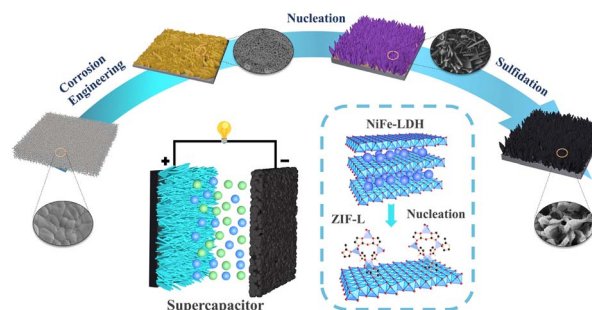
Hyung Wook Choi, Jiwon Kim, Hyeon-Seok Bang, Khaled Badawy, Ui Young Lee, Dong In Jeong, Yeseul Kim, Kotiba Hamad, Bong Kyun Kang, Byung Mook Weon, Hyung-Suk Oh,\* Nirpendra Singh\* and Dae Ho Yoon\*



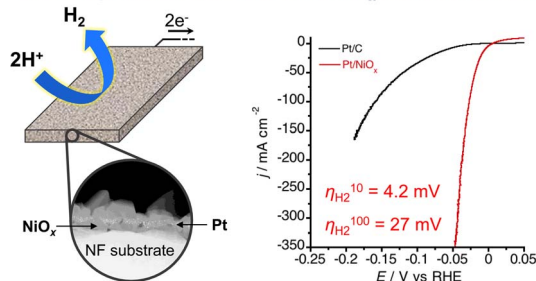
7080

### Ultrafast metal corrosion engineering facilitates the construction of CoS<sub>x</sub> derived from MOFs as enhanced supercapacitor electrodes

Hao Chen, Xuehua Yan,\* Jianmei Pan, Zohreh Shahnavaaz and Jamile Mohammadi Moradian

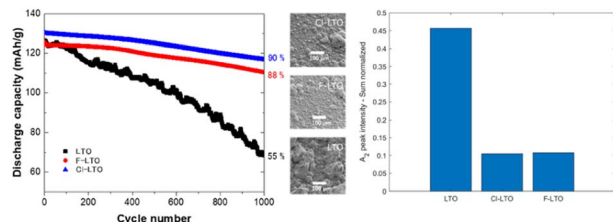


7094

Extremely efficient and robust Pt/NiO<sub>x</sub> cathode for HERExtremely efficient and stable hydrogen evolution by a Pt/NiO<sub>x</sub> composite film deposited on a nickel foam using a mixed metal-imidazole casting method

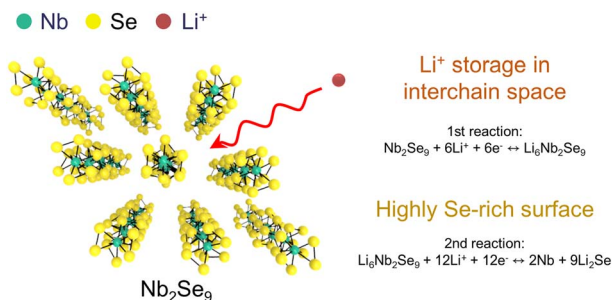
Zaki N. Zahran,\* Yuta Tsubonouchi, Debraj Chandra, Tomoki Kanazawa, Shunsuke Nozawa, Eman A. Mohamed, Norihisa Hoshino and Masayuki Yagi\*

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Mixed anion effects on structural and electrochemical characteristics of Li<sub>4</sub>Ti<sub>5</sub>O<sub>12</sub> for high-rate and durable anode materials

Hye-min Kim, Dae-wook Kim, Kenjiro Hara, Hiromasa Shiiba, Youn Charles-Blin, Eugenio Otal, Hideki Tanaka, Katsuya Teshima, Gabriel Sánchez-Santolino, Ryo Ishikawa, Yuichi Ikuhara and Nobuyuki Zettsu\*

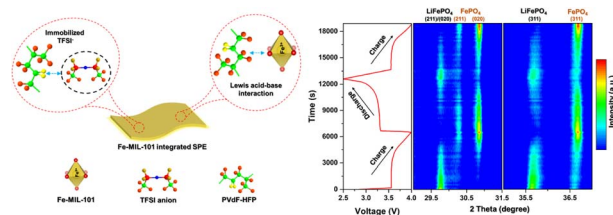
7122



## One-dimensional van der Waals transition metal chalcogenide as an anode material for advanced lithium-ion batteries

Woosung Choi, Seungbae Oh, Sunhyun Hwang, Sudong Chae, Hyunyoung Park, Wontae Lee, Chaeheon Woo, Xue Dong, Kyung Hwan Choi, Jungyoon Ahn, Yeongjin Kim, Xiaojie Zhang, Jinsu Kang, Hyeon-Seok Bang, Jiho Jeon, Hyung-Suk Oh, Jongsoo Kim, Jae-Young Choi\* and Won-Sub Yoon\*

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## Fe-MIL-101 metal organic framework integrated solid polymer electrolytes for high-performance solid-state lithium metal batteries

Ramesh Subramani, Su-Yang Hsu, Yu-Chun Chuang, Liang-Ching Hsu, Kueih-Tzu Lu\* and Jin-Ming Chen\*

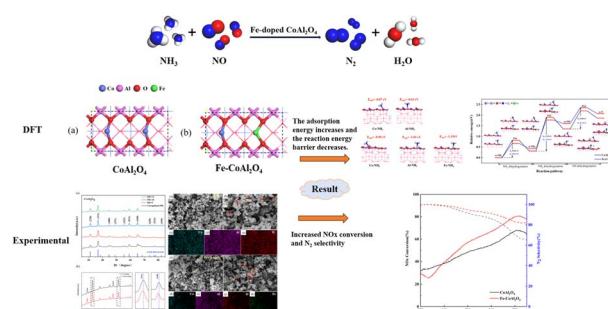




7142

### A combined DFT and experimental study of NO by NH<sub>3</sub>-selective catalytic reduction over an Fe-doped CoAl<sub>2</sub>O<sub>4</sub> catalyst

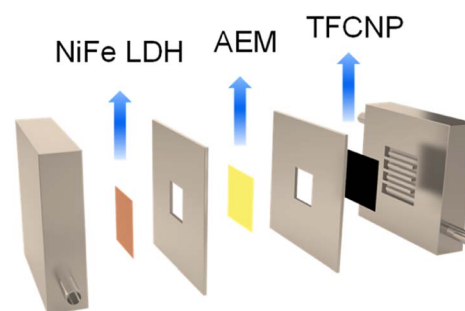
Xu Wang, Xiaodi Jiang, Wei Xiong, Weiyao Wang, Taoyuan Ouyang, Yulong Deng, Wen Gao, Xiaoming Cai, Jinming Cai and Honglin Tan\*



7156

### Titanium nitride supported ternary metal phosphides for hydrogen evolution

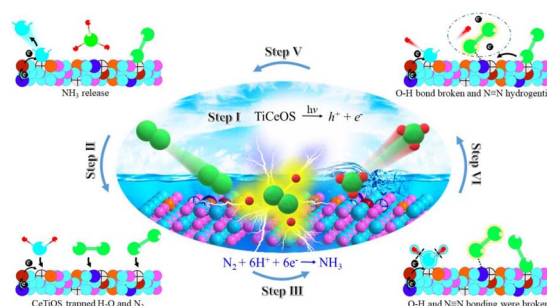
Jia Zhao, Nan Liao, Daniel Wun Fung Cheung and Jingshan Luo\*



7163

### Photocatalytic fixation of nitrogen to ammonia with a Ce/S co-doped TiO<sub>2</sub> catalyst: synergistic tuning of heterovalent metal states and oxygen vacancy defects

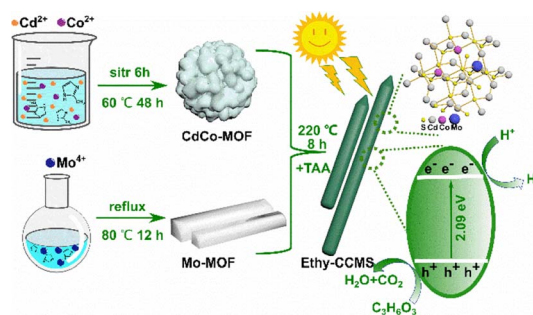
Pengkun Zhang, Longyan Chen, Dong-Hau Kuo,\* Binghong Wu, Zhengjie Su, Dongfang Lu,\* Qinhan Wu, Jiqing Li,\* Jinguo Lin\* and Xiaoyun Chen\*



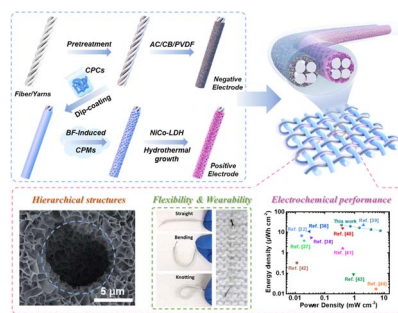
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### Synthesis of non-noble metal solid solution (Cd<sub>0.76</sub>Co<sub>0.17</sub>Mo<sub>0.07</sub>S) via MOF precursors for enhanced hydrogen production

Haiyuan Li and Dingxin Liu\*



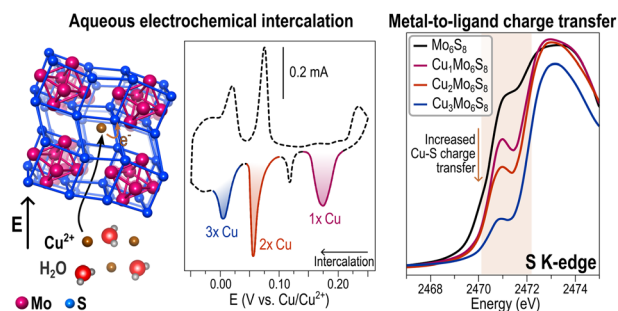
7187



### A hierarchical layered double hydroxide electrode with surface porous microstructured fibers for flexible and wearable energy storage

Junxian Huang, Bingang Xu,\* Mei Yi So, Xinlong Liu and Yuanyuan Gao

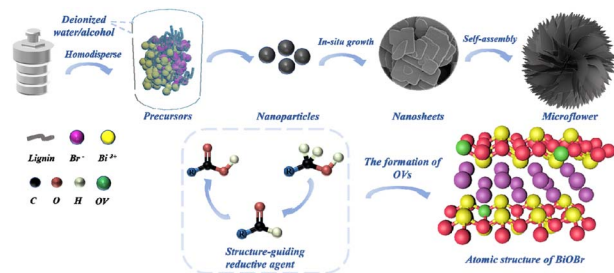
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### Electrochemical control over stoichiometry via cation intercalation into Chevrel-phase sulphides ( $\text{Cu}_x\text{Mo}_6\text{S}_8$ , $x = 1-3$ )

Kabian A. Ritter, Konstantina G. Mason, Suxuen Yew, Joseph T. Perryman, Jessica C. Ortiz-Rodriguez, Nicholas R. Singstock,\* Brian A. Wuille Bille,\* Charles B. Musgrave\* and Jesús M. Velázquez\*

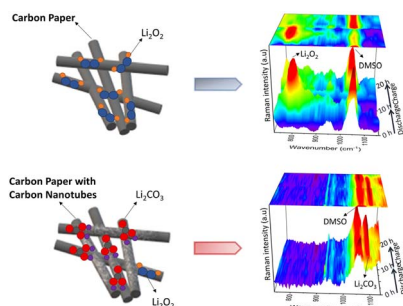
7207



### Enhancement effect of oxygen vacancy on photocatalytic $\text{CO}_2$ reduction

Qiang Yang, Yunyi Wang, Qingwen Tian,\* Xiang Li, Aixiang Pan, Mengke Zhao, Yawei Zhu, Ting Wu\* and Guigan Fang\*

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### Exploring carbon electrode parameters in $\text{Li}-\text{O}_2$ cells: $\text{Li}_2\text{O}_2$ and $\text{Li}_2\text{CO}_3$ formation

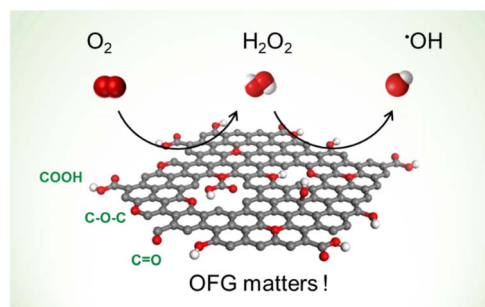
Bianca P. Sousa, Chayene G. Anchieta, Thayane M. C. Nepel, Alex R. Neale, Laurence J. Hardwick, Rubens M. Filho and Gustavo Doubek\*



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## Modulating coal-derived carbon toward electrocatalytic generation of hydroxyl radicals for organic contaminant removal

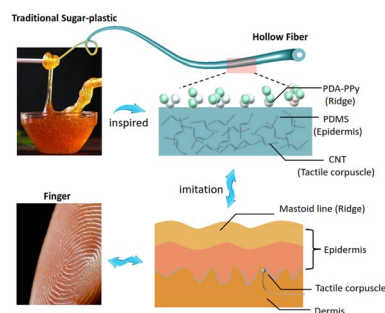
Guoqiang Zhao, Tianci Chen, Aidong Tang\* and Huaming Yang\*



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## Sugar-plastic assisted fabrication of hollow PDMS wearable fabrics toward excellent sensory capabilities

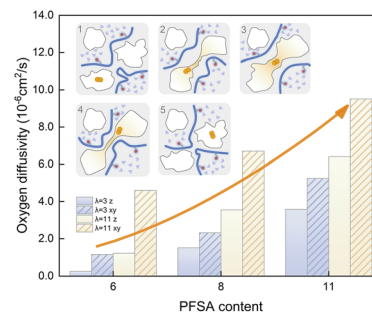
Mei Liu, Shiqiang Song,\* Zhenlin Jiang,\* Yujie Xiong and Yong Zhang



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## Insight into oxygen diffusion mechanism in ionomer film on catalyst surface with varying perfluorosulfonic acid and water contents

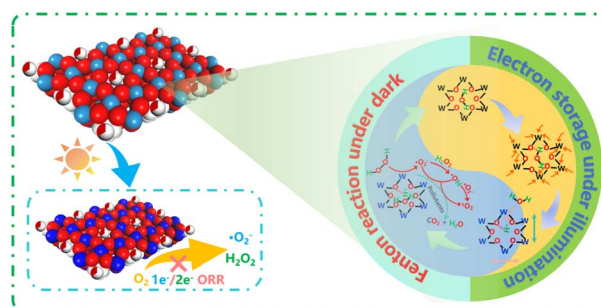
Jiabin You, Huiyuan Li, Yong Feng, Xiaojing Cheng, Liuxuan Luo, Daihui Yang, Guanghua Wei, Shuiyun Shen, Xiaohui Yan\* and Junliang Zhang\*



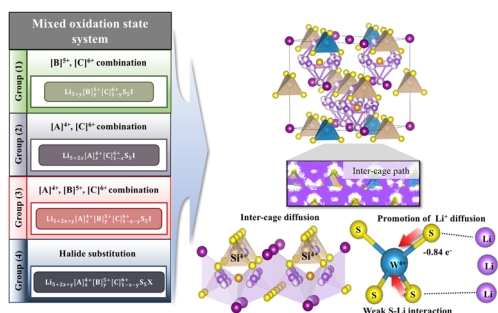
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## Correction and new understanding of the reactivity of illuminated tungsten trioxide in the dark: antecedents and consequences of photo-storage electrons triggering Fenton reactions

Hao Huang, Hui-Long Wang\* and Wen-Feng Jiang\*



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### Design of multicomponent argyrodite based on a mixed oxidation state as promising solid-state electrolyte using moment tensor potentials

Ji Won Lee, Ji Hoon Kim, Ji Seon Kim, Yong Jun Jang, Sun Ho Choi, Seong Hyeon Choi, Sung Man Cho, Yong-Gu Kim and Sang Uck Lee\*

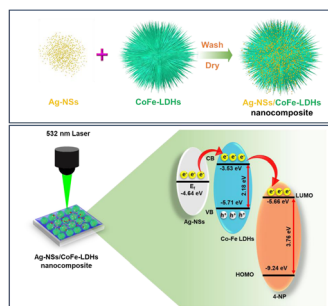
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### Nanoscale stirring at the liquid–liquid interface: the interfacial nano-vortexer actively converges immiscible biphasic reactants for enhanced phase-transfer catalysis

Zhi Zhong Ang, Veronica Pereira, Siew Kheng Boong, Haitao Li and Hiang Kwee Lee\*

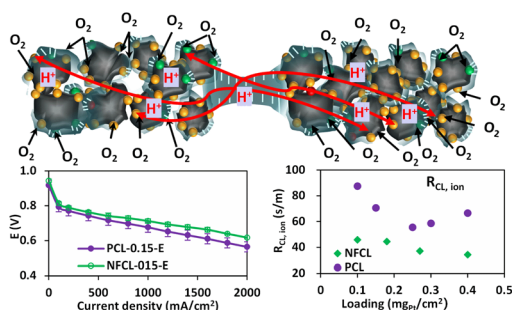
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### Plasmonic coupling of silver nanospheres loaded on cobalt–iron layered double hydroxides: a robust SERS probe for 4-nitrophenol detection

Thangavelu Kokulnathan, Kalingarayanpalayam Matheswaran Arun Kumar, Tzyy-Jiann Wang,\* Elumalai Ashok Kumar, Allen Joseph Anthuvan, Kai-Jiun Chen and Yung-Yu Liang

7300



### Enhanced PEMFC performance through high O<sub>2</sub> permeation and proton conductive electrospun nanofiber electrodes with unique ionomer construction

Xue Zhang, Fang Liu,\* Xinjie Yuan, Jing Shan, Xiaoyan Wu, Yalin Zhang, Junning Wen and Zhongjun Hou\*

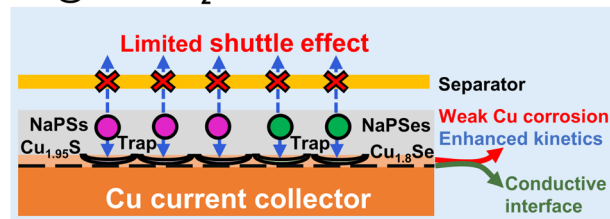


7311

### Integrated copper host/current collector engineering for enhanced sodium storage in $\text{SeS}_2$ electrodes

Guanghui Chen, Chengjiang Deng, Qi An, Haobin Song, Liuyuan Ma, Peng Mei\* and Shaozhan Huang\*

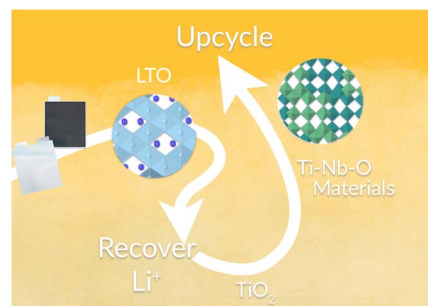
#### $\text{Cu@CNT/SeS}_2 + \text{Cu}$



7321

### High-power recycling: upcycling to the next generation of high-power anodes for Li-ion battery applications

A. J. Green, E. H. Driscoll,\* P. A. Anderson, E. Kendrick and P. R. Slater\*



7329

### Correction: Ultrafast metal corrosion engineering facilitates the construction of $\text{CoS}_x$ derived from MOFs as enhanced supercapacitor electrodes

Hao Chen, Xuehua Yan,\* Jianmei Pan, Zohreh Shahnava and Jamile Mohammadi Moradian

7330

### Correction: Ultra-broadband microwave absorption of $(\text{Mn}_{0.2}\text{Fe}_{0.2}\text{Zn}_{1.2})_x$ substituted $\text{Co}_2\text{Y}$ hexaferrites with a self-aligned sheet stacked, highly c-axis oriented and multi-domain structure

Yijian Liu, Haifeng Li,\* Xutao Yan, Jihui Sun, Jiabao Zang, Xiang Luo, Li Sun and Meijie Zhang



## RETRACTION

7331

**Retraction: Interfacial adsorption study of nitrogen based inhibitors in silane nanocontainers as anticorrosive and self-healing material for steel in strong acid solution**

Darris M. S. and S. M. A. Shibli

