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Journal of Materials Chemistry A

Materials for energy and sustainability

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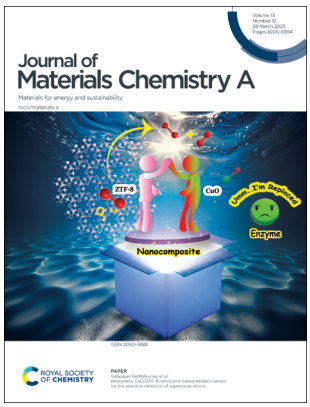

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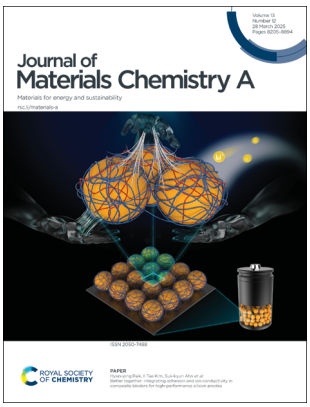

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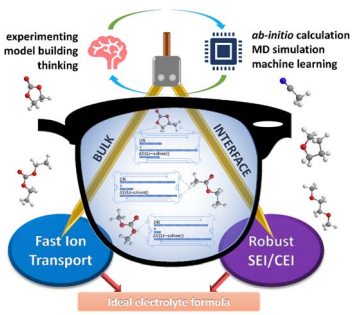
See Hyun-jong Paik, Il Tae Kim, Suk-kyun Ahn *et al.*, pp. 8355–8367. Image reproduced by permission of Suk-kyun Ahn from *J. Mater. Chem. A*, 2025, **13**, 8355.

REVIEWS

8223

Enabling rational electrolyte design for lithium batteries through precise descriptors: progress and future perspectives

Baichuan Cui and Jijian Xu*



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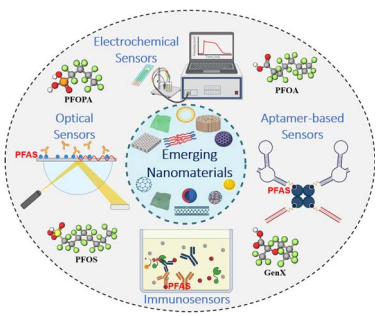
Emerging nanomaterials for the detection of per- and poly-fluorinated substances

Ajith Manayil Parambil, Eepsita Priyadarshini, Shounik Paul, Aristides Bakandritsos, Virender K. Sharma* and Radek Zbořil*



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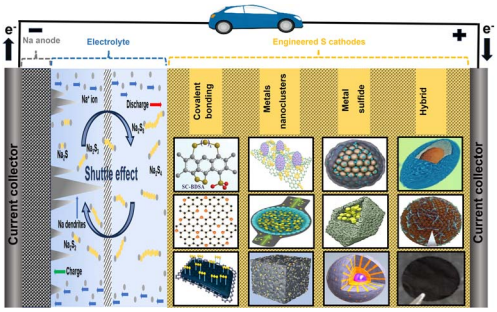
REVIEWS

8282

Cutting-edge approaches for customizing sulfur cathode materials in sodium–sulfur batteries operating at ambient temperature

Pratik Shrinivas Khaire, Deepak Kumar, Kuldeep Mishra* and Anindita Roy*



8315

Can the high throughput yield of solar thermal interfacial evaporation systems be beyond theoretical efficiency?

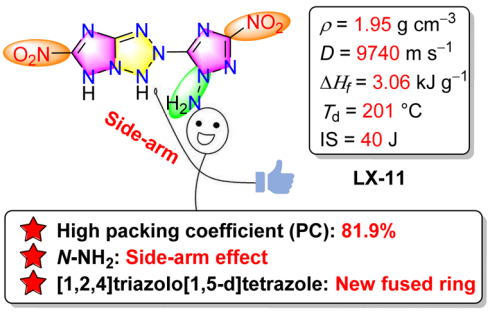
Ghazala Maqsood, Muhammad Sultan Irshad,* Naila Arshad, Muhammad Sohail Asghar, Muhammad Atif Ali, Tao Mei and Xianbao Wang*

COMMUNICATION

8337

A high-performance low-sensitivity explosive, LX-11: benefiting from N–NH_2 side-arm hydrogen bonding

Shaoqing Wang, Shaojia Li, Jialin Wang, Ziang Wang, Hongquan Yin, Qing Ma and Fu-Xue Chen*



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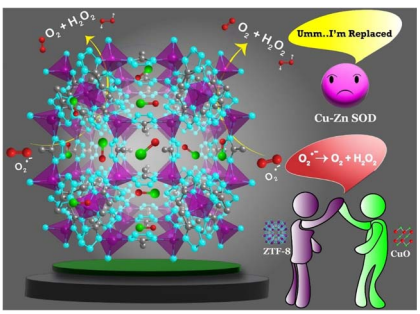
Biomimetic CuO/ZTF-8 nanozyme-based neoteric sensor for the selective detection of superoxide anions

Vadakke Purakkal Sruthi, Shafeeq Sarfudeen, Tamas Panda, Kathavarayan Thenmozhi and Sellappan Senthilkumar*



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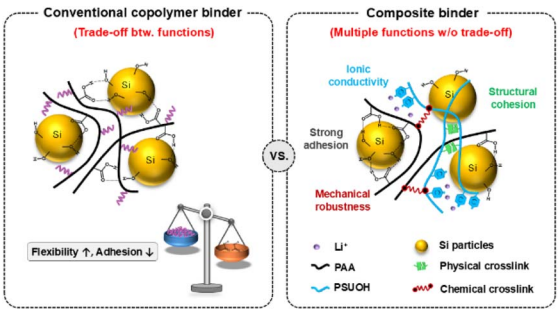

Better together: integrating adhesion and ion conductivity in composite binders for high-performance silicon anodes

Anjali N. Preman, Suraj Aswale, Tejaswi T. Salunkhe, Seungjae Lee, Min Chan Kim, Subramani Devaraju, Kyu Hyun, Hyun-jong Paik,* Il Tae Kim* and Suk-kyun Ahn*

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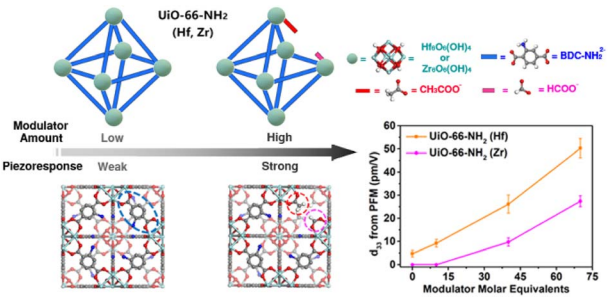

Structural engineering through modulator incorporation in UiO-66-NH_2 metal–organic frameworks for piezoresponse regulation

Zhi Yu, Dingqi Wang, Tian Zheng, Ali Zavabeti, Yongqiang Wang, Chao Wu, Jianing Yang, Yalou Guo, Paul A. Webley* and Gang Kevin Li*

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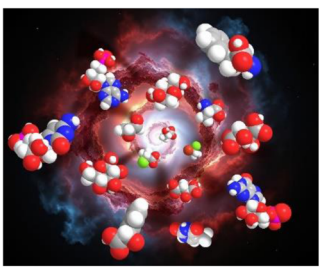
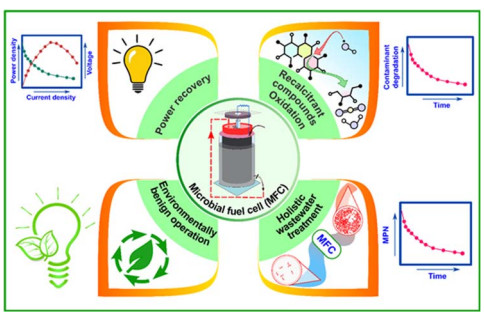


Chiral separation of enantiomers.

Homochiral metal–organic framework membranes synthesized using a nonstochastic chiral bias for enhanced enantioselective separation

Boxun Li, Yue Feng, Dan Zhou, Maochun Yang, Dan Li, Shuai Zhang, Jingru Fu and Teng Ben*

8385



Catalysing holistic wastewater treatment, electricity generation, and emerging contaminant removal in a pre-pilot Fenton-microbial fuel cell

Anil Dhanda, Lakshmi Pathi Thulluru, Rishabh Raj, Rajarshi Bhar, Shamik Chowdhury, Saikat Kumar Kuila, Brajesh K. Dubey and Makarand M. Ghangrekar*

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PAPERS

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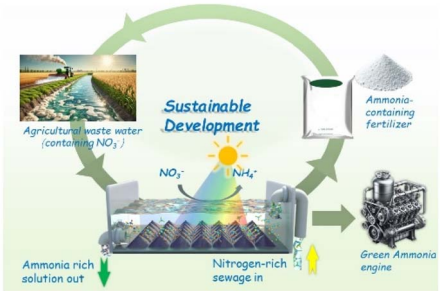
Bias-free Si-based photocathode for efficient photoelectrochemical ammonia synthesis and HMF oxidation

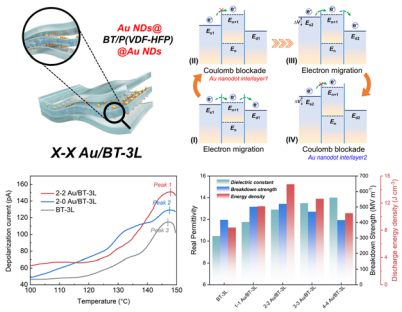
Yuxi Cao, Xinyi Luo, Xiaoliang Ren, Junru Chen, Hao Liang, Kang Wang* and Feng Jiang*



8406

Constructing dual interfacial gold nanodot interlayers in sandwich-structured $BaTiO_3$/P(VDF-HFP) composites for high energy storage density

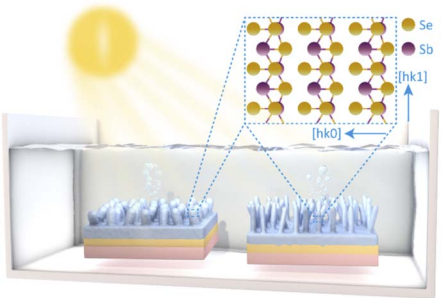
Peng Yin, Xiaohan Bie, Qingyang Tang, Linwei Zhu, Runhua Fan, Davoud Dastan, Hongzhi Cui, Kun Zhang* and Zhicheng Shi*



8416

Nanowire morphology control in Sb metal-derived antimony selenide photocathodes for solar water splitting

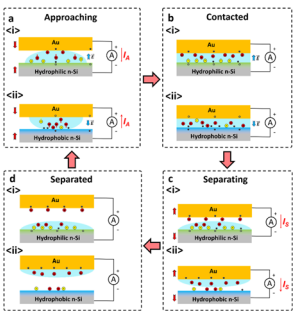
Zhenbin Wang, Yongping Gan, Erin Service, Pardis Adams, Thomas Moehl, Wenzhe Niu* and S. David Tilley*



8425

Output power density enhancement of an intermittently contacted metal–semiconductor junction with a water interlayer

Xinru Fan, Shuo Zhang, Qihan Chen, Min Li, Haifei Lu, Shuo Deng* and Qing Zhang*



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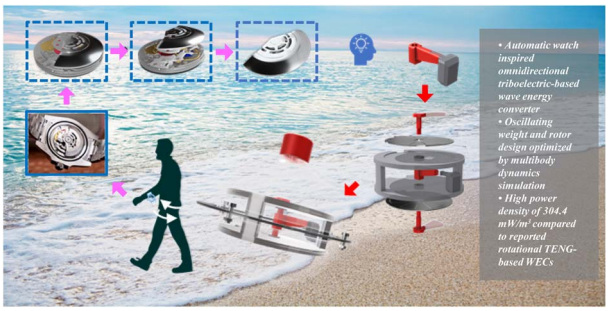
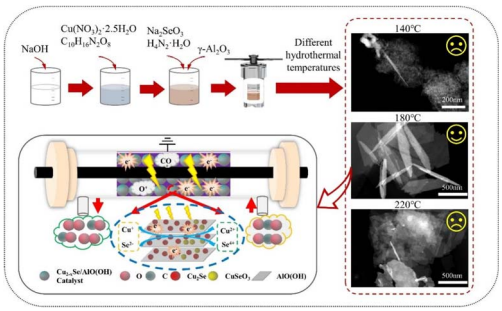


An omnidirectional triboelectric wave energy harvester driven by an automatic watch-inspired oscillating weight

Jasim M. Almardi, Xiangkun Bo, Jihong Shi, Weilu Li, Fei Liu, Irum Firdous and Walid A. Daoud*

8445



CO_2 reduction by dielectric barrier discharge plasma in collaboration with $Cu_{2-x}Se$/AlO(OH) catalyst

Yi Chen, Weilin Shi, Claudia Li, Kang Hui Lim, Xueqian Wang, Langlang Wang, Ping Ning, Yixing Ma* and Sibudjing Kawi*

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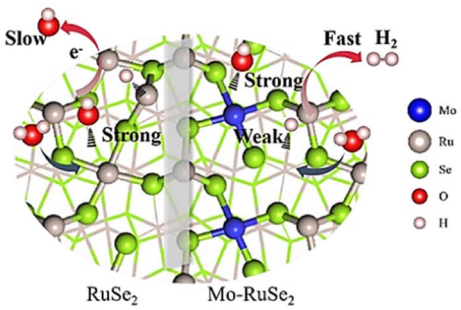

Competitive adsorption strategy for adsorbed intermediates boosting alkaline hydrogen evolution

Yupei Ding, Jie Zhu, Minxia Jiang, Xiaowan Zhan, Jinwen Qin,* Xue Jiang, Shuaifeng Wang, Tao Meng* and Minhua Cao*

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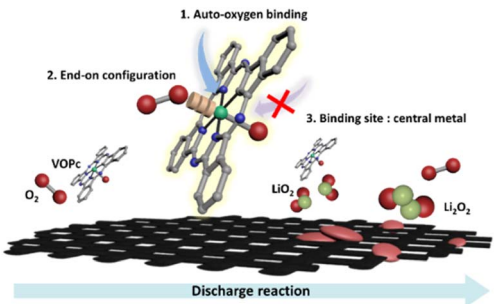

Enhancing redox stability of lithium–oxygen batteries *via* introducing an oxygen pre-coordinated vanadyl phthalocyanine catalyst

Boran Kim, Hyunji Kweon, Yeji Lim, Hyunyoung Park, Jongsoon Kim* and Won-Hee Ryu*

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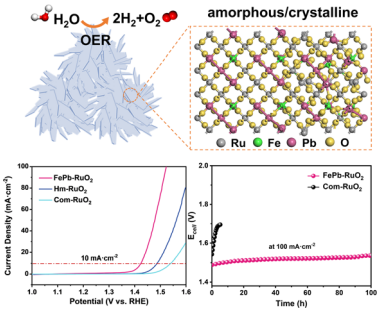
An FePb-doped RuO_2 coupled amorphous/crystalline heterophase for efficient acidic oxygen evolution reaction

Yan Zhao, Yu Long, Wenwen Liu, Zhenyong Han, Yuteng Cui, Zhijun Li, Wanglei Wang, Zhiyao Duan* and Xiaogang Fu*



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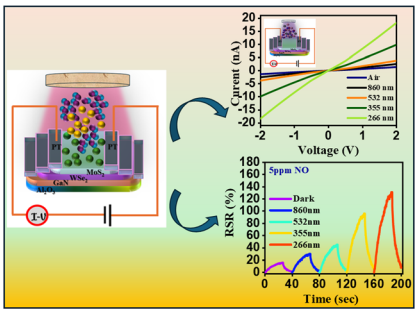
Light stimulation enhanced detection of NO at ppb-level at room temperature using $MoS_2/WSe_2/GaN$ heterostructure sensor

Anuj Sharma, Urvashi Varshney and Govind Gupta*



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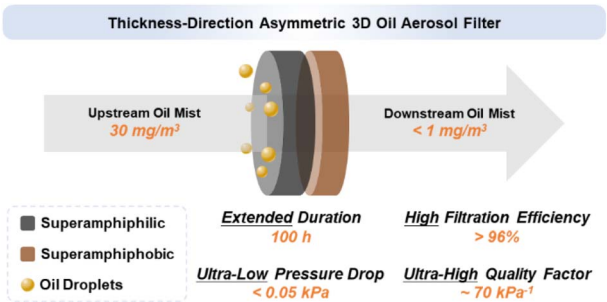
Enhanced 3D sponge with asymmetric wettability: an efficient solution for ultra-low resistance oil aerosol filtration over extended durations

Shuaiheng Zhao, Fangqi Zhou, Ye Tian, Yue Liu, Shasha Feng* and Lin Feng*



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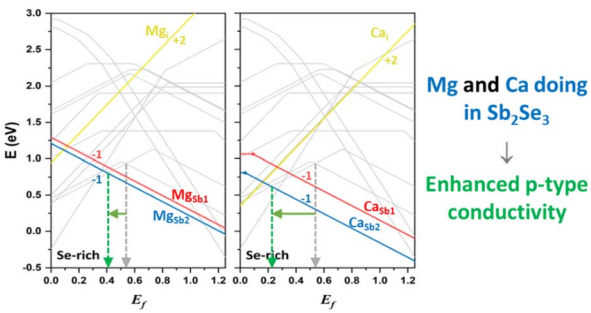
Enhanced P-type conductivity in Sb_2Se_3 through alkali and alkaline earth metal doping

Eunkyung Cho,* Shi-Joon Sung, Kee-Jeong Yang, Jaebaek Lee, Van-Quy Hoang, Bashiru Kadiri-English, Dae-Kue Hwang, Jin-Kyu Kang and Dae-Hwan Kim*



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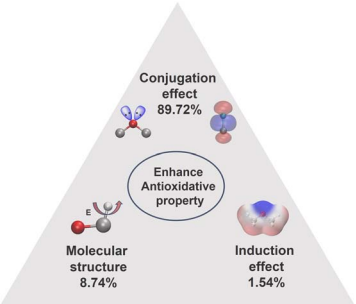

The leveraging ether C–H bond shielding strategy for antioxidative electrolyte in lithium-ion batteries

Dehuan Shi, Lei Wang, Zheming Chen, Zheyuan Liu,* Yan Yu* and Chengkai Yang*

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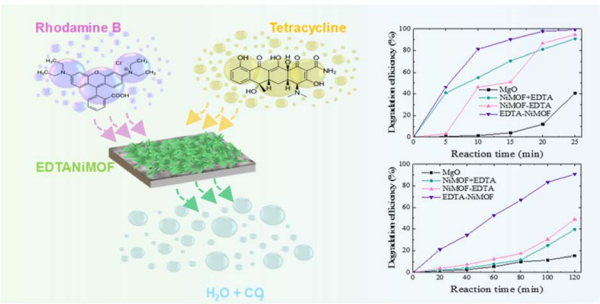

Transformative chelation pathways unveiling NiMOF-LDH hybrids on MgO for high-efficiency photocatalysis

Mohammad Aadil, Ananda Repycha Safira, Mohammad Alkaseem, Taekjib Choi and Mosab Kaseem*

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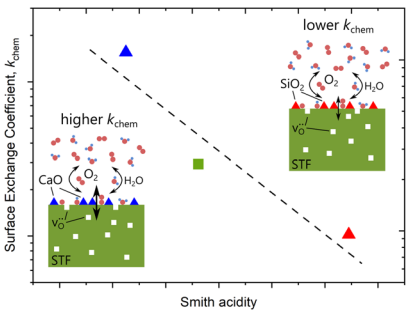

Understanding the role of acidity on the surface exchange reaction in mixed conductors: what is the effect of surface hydration?

David M. Schwenkel, Roger A. De Souza and George F. Harrington*

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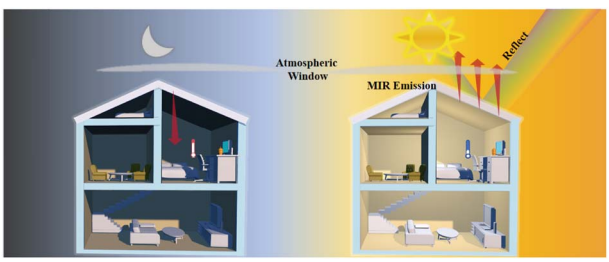

Multifunctional broadband emitters based on rare earth phosphors for all-weather and efficient radiative cooling and energy saving

Qinglong Hu, Ruiming Tan, Pengjie Zhong, Keyu Han,* Yinyan Li, Peng Xue* and Gongxun Bai*

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PAPERS

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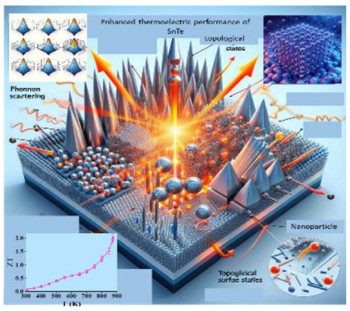
Maximizing thermoelectric performance in SnTe through strategic co-doping, nanostructuring, and topological insights

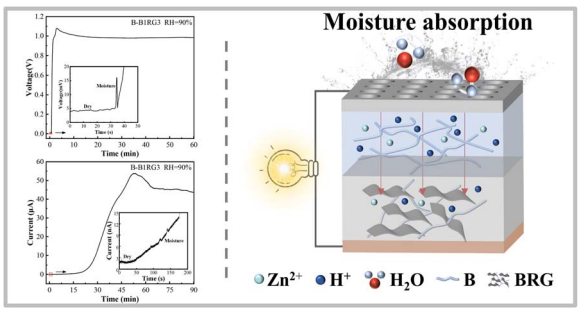
Peramaiyan Ganesan,* Chandra Shekar Gantepogu, Sidharth Duraisamy, Phillip Wu, Gwo-Tzong Huang, Muhammad Yusuf Fakhri, Kuei-Hsien Chen, Yang-Yuan Chen and Maw-Kuen Wu*



8571

Bacterial cellulose/reduced graphene oxide bilayer films for moist-electric power generation

Xinye Li, Rui Zhang, Xin Ai, Ping Tang, Hai Wang* and Yuezhen Bin*



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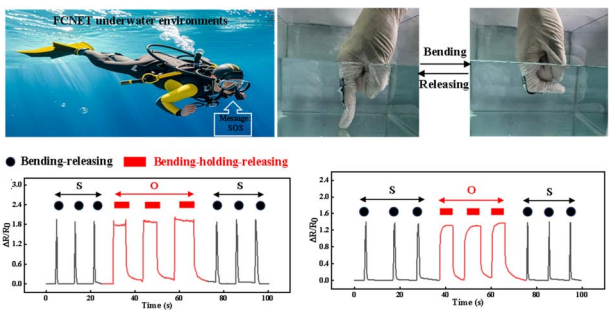
A fluorinated carbon nanodot-tube/MXene/microfiber electronic textile with high water-interference-resistance for stable amphibious human motion monitoring

Yibo Wang, Jiansong Lu, Guangying Zhang, Haoyang Song, Yang Cai, Ximan Wang, Hongjia Zhang, Feng Fang, Changsheng Liu and Yongquan Qing*



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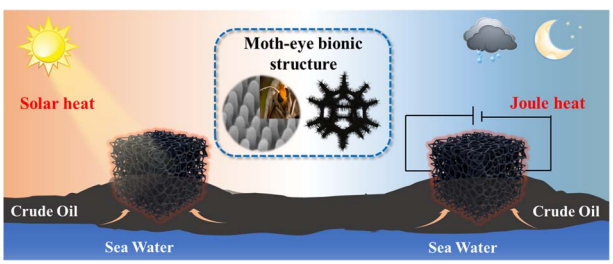
Bio-inspired polypyrrole nanowire arrays on melamine foam with high-performance photo/electro-thermal conversion for all-weather cleanup of crude oil

Qin Wang, Yu-long Liu, Zi-jie Huang, Zi-cheng Tang, De-xiang Sun, Jing-hui Yang, Xiao-dong Qi* and Yong Wang*



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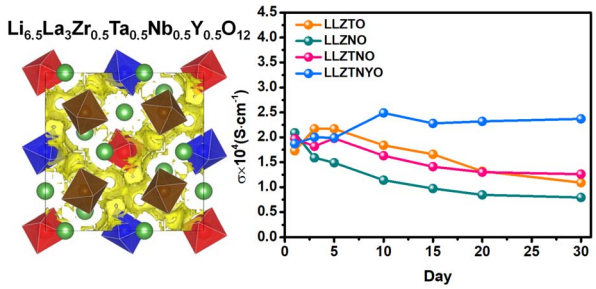

A medium-entropy garnet-type oxide as a solid electrolyte with enhanced air stability for Li-ion batteries

Chun-Han Kuo, Po-Yen Huang, Ai-Yin Wang, Hao-Yu Liu, Hsu-Chen Cheng, Chih-Heng Lee, Cheng-Rong Hsing, Shu-Yu Chen, Chien-Hao Yeh, Hsiang-Jung Chen, Huaican Chen, Wen Yin, Jianyuan Wu, Chih-Wen Pao, Wang Hay Kan,* Hsin-Yi Tiffany Chen* and Han-Yi Chen*

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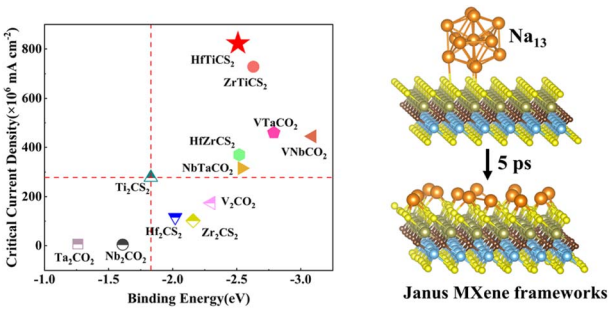

Rational design of Janus MXene monolayers as promising frameworks for high-performance sodium metal anodes

Shengbo Wang, Ziang Ren, Jinsen Zhang, Shihui Zou, Huadong Yuan, Jianmin Luo, Yujing Liu, Jianwei Nai, Yao Wang* and Xinyong Tao

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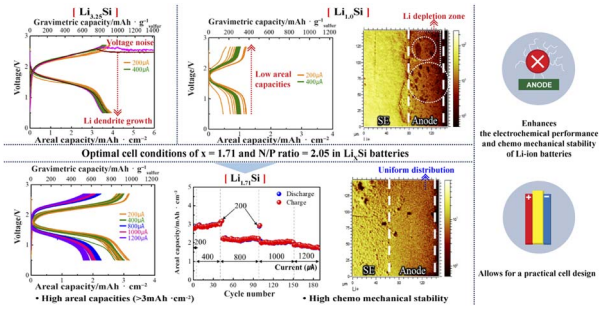
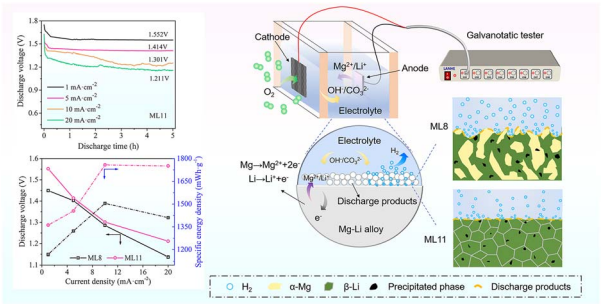


Elucidating the correlation between the prelithiation concentration of a Li_xSi anode and performance of all-solid-state lithium–sulfur batteries

Minju Kim, Yuhong Jeong, Sung Kang, Jungjae Park, Jung-Hoon Song, Tae Ho Shin and Hyung-Tae Lim*

8642



The effect of lithium content on the discharge and electrochemical performance of Mg–Li–Zn–Y alloys for primary Mg–air batteries

Xu Cheng, Beibei Sun, Tingting Wei, Jiemin Dong, Xin Cao, Jiaxin Zhang, Yanhua Zhang, Tao Wang, Yanhui Liu, Feng Zhong,* Ming Liang* and Jianfeng Li

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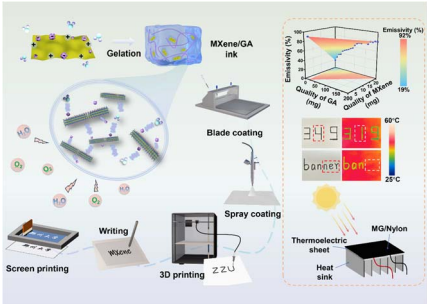
8654

Antioxidative, low-concentration MXene inks with high-viscosity for infrared encryption and thermal energy harvesting

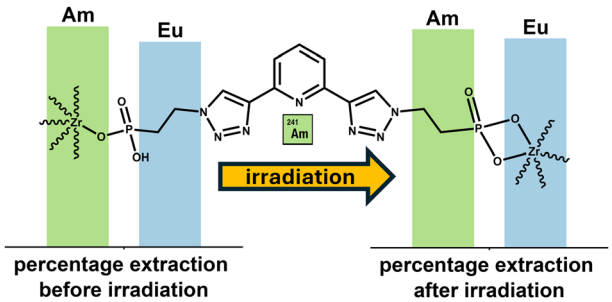
Xueting Zhang, Ruiqi Yu, Mengyao Wang, Zifan Song, Xiangxin Li, Yadong Gao, Wanjie Wang* and Jianfeng Wang*



8666

Probing the high radiation tolerance of minor actinide selective zirconium phosphonate sorbents

Taren Cataldo, Thibault Charpentier, Gautier Landrot, Stephanie Chua, Nicholas M. Bedford,* Jessica Veliscek-Carolan* and Sophie Le Caër*



8679

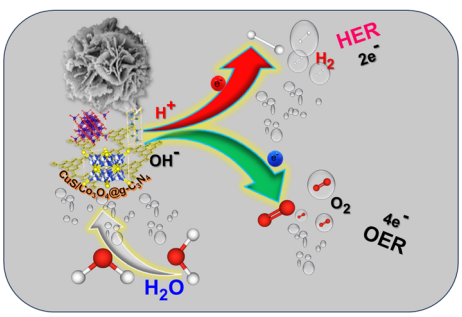
Ultra-micropores of hard carbons for ultrafast Na-ion storage

Hu Zhang, Jian Yin,* Dandan Ouyang, Yu Liu, Ruiyao Wu, Rui Zhang, Ruiqiang Huo, Gaixiu Yang, Yanjun Cai* and Jiao Yin*

8691

Constructing a polycrystalline hybrid ternary CuS/Co_3O_4 with supported graphitic nitride electrocatalyst for bifunctional water splitting reactions

Imtiaz Ahmed, Zahir Abbas and Shaikh M. Mobin*



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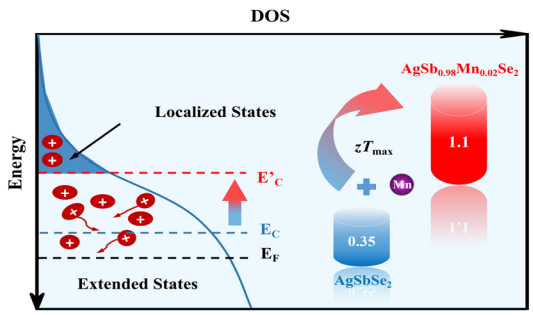
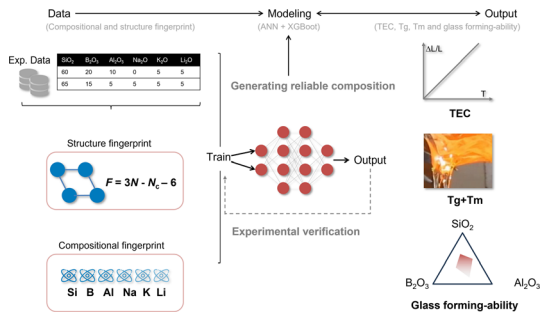
8706



Regulation of Anderson localization for enhancing thermoelectric properties in Mn doped $AgSbSe_2$ compounds

Yaqiong Zhong, Keke Liu, Shuo Chen, Hao Sang, Xili Wen, Qingjie Zhang, Jinsong Wu, Pierre Ferdinand Poudeu Poudeu, Xianli Su,* Ctirad Uher and Xinfeng Tang*

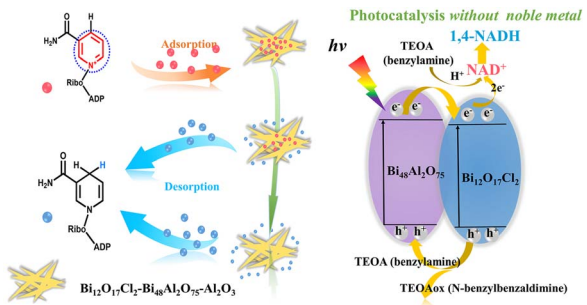
8715



Accelerating discovery of glass materials in electronic devices through topology-guided machine learning

Huang Ming, Li Yahao, Hu Yongxing, Mao Haijun, Liu Zhuofeng, Li Wei, Wang Fenglin, Ye Yicong, Zhang Weijun* and Chen Xingyu*

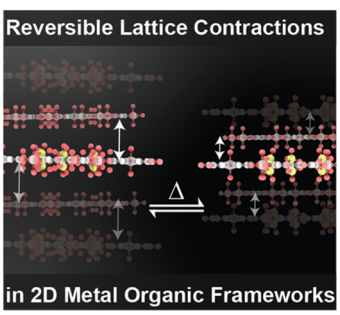
8726



High yield regeneration of 1,4-NAD(P)H *via* selective adsorption-/desorption-mediated visible-light photocatalysis on a noble-metal-free catalyst

Zheng-Wu Wang, Xin Tan, Zheng-Hao Wu, Jun-Hao Chen, Yi-Zhou Zhu* and He-Fang Wang*

8734



Continuous and reversible tuning of inter-layer spacings in two-dimensional conductive metal organic frameworks

Gopi M. R. Dontireddy, Satya Prakash Suman, Jose L. Merino-Gardea, Ahad Hussain Javed, Jiande Wang, Tianyang Chen, Stavroula Kampouri and Harish Banda*

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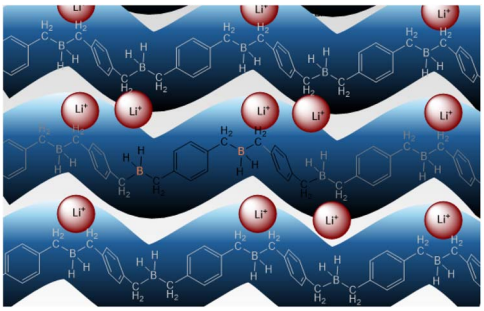
8742

Single-ion-conducting polymer electrolytes based upon borate-chain step-growth polymers

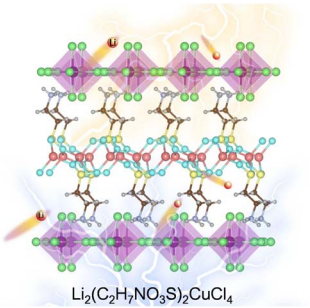
Megan M. Van Vliet, Stephanie L. Wunder* and Michael J. Zdilla*



8750

Deciphering the role of van der Waals heterostructures in enhancing layered perovskite anodes for high-performance lithium-ion batteries

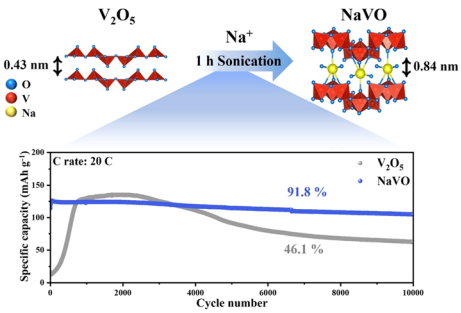
Xiao-Hui Wu, Yun Chai, Jie Shen, Pei-Wen Huang, Si-Yu Xu, Hou-Yang Zhong, Bi-Cui Chen, Yi Zhao,* Baisheng Sa* and Ke-Zhao Du*



8761

Enhanced electrochemical performance of aqueous Zn-ion batteries based on $Na_2V_6O_{16}\cdot 2H_2O$ cathodes: insights from DFT and synchrotron X-ray analysis

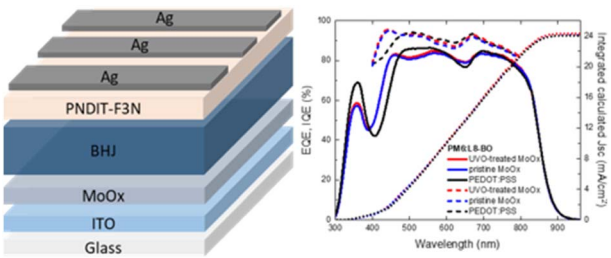
Younghee So, Huncheol Seo, Seung Hwan Lee, Eunseo Lee, Jinyoung Lee, Joonhee Kang, Young Yong Kim,* Byung-Hyun Kim* and Sungwook Mhin*



8774

Highly efficient organic solar cells enabled by ultraviolet-ozone treated molybdenum oxide hole transport layers

Apostolos Panagiotopoulos, George Kakavelakis,* Kyriakos Almpanidis, Leslie Askew, Dimitar I. Kutsarov and S. Ravi P. Silva*



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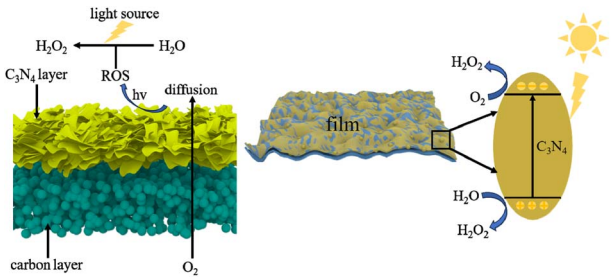
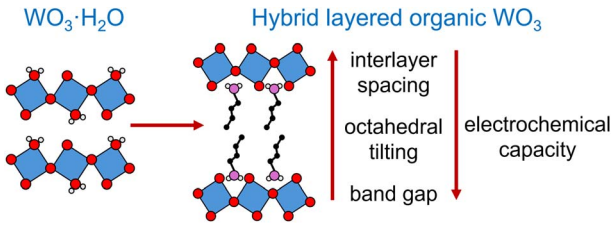
8790



Artificial photosynthesis of H_2O_2 over a self-assembled two-dimensional g-C_3N_4 film

Aoli Liu and Jianwei Zhou*

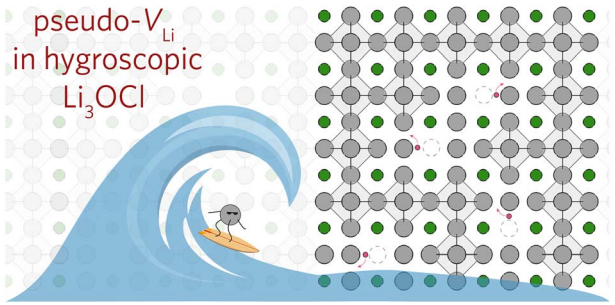
8804



Interlayer pillaring influences the octahedral tilting and electrochemical capacity of tungsten oxides

Ran Ding, Michael A. Spencer, Noah P. Holzapfel, Matthew Chagnot and Veronica Augustyn*

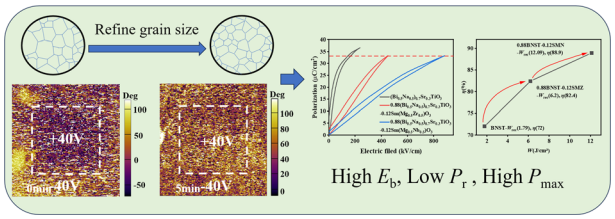
8816



Pseudo-lithium vacancies in hydrogen rich Li_3OCl

Benjamin A. D. Williamson,* Kristoffer Eggestad and Sverre M. Selbach

8825



Achieving ultra-high energy storage performance in $(Bi_{0.5}Na_{0.5})_{0.7}Sr_{0.3}TiO_3$-based relaxor ferroelectrics

Xin Zhang, Shiyu Yang, Qinpeng Dong, Yue Pan, Xiuli Chen,* Xu Li* and Huanfu Zhou

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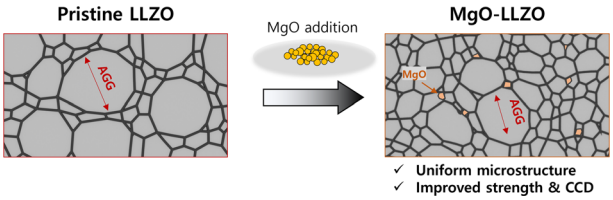
8835

Investigation of MgO additives on microstructure and properties of thin LLZO electrolytes for all-solid-state batteries

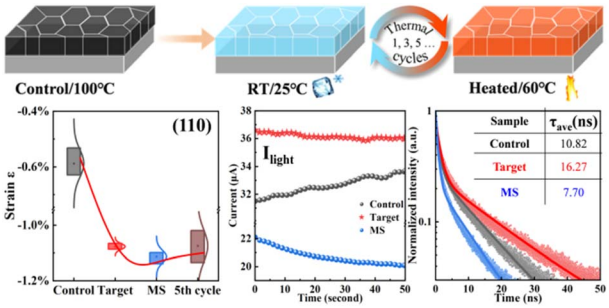
Wooseok Go, Marca M. Doeff and Michael C. Tucker*



8843

Tuning photoelectric conversion in hybrid perovskites by thermal cycling

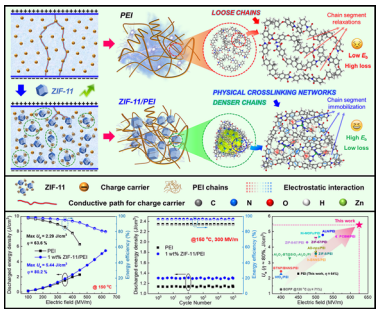
Shengjian Qin, Hang Su, Yinan Jiao, Jiale Meng, Jiayu Song, Jinjin Zhao* and Jian Lu*



8852

Engineering metal–organic framework towards suppressed leakage current in polymer nanocomposites

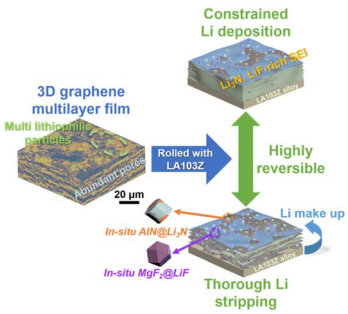
Fanrong Kong, Wenying Zhou,* Fan Zhang, Weiwei Li, Haomiao Li, Yuanwei Zhu, Bin Zhou, Tian Yao and Bo Li*



8865

Free-standing graphene films decorated with lithiophilic particles as host electrodes for lithium plating/stripping in anode-less lithium metal batteries

Mingliang Bai, Min Zhong,* Wenzhuo Shen, Jiali Zhang and Shouwu Guo*



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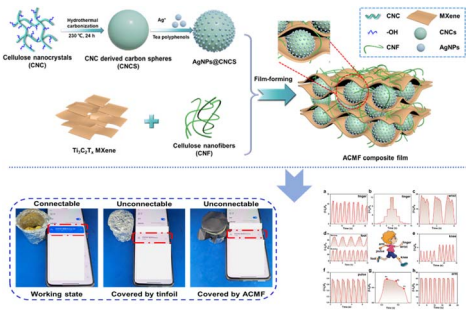

MXene/nanocellulose/carbon sphere composite films with a multistage "egg-box" structure for electromagnetic-interference shielding and pressure sensors

Lansheng Wei, Yu Ren, Yujie Hou, Peng Jin, Yonghua Zheng and Zhengguo Wu*

CORRECTIONS

8890

Correction: Aromatic polyaroxydiazole pseudocapacitive anode materials with tunable electrochemical performance through side group engineering

Yan Jiang, Chen Yang, Yuanyuan Yu, Yulin Zhou, Zhoutai Shang, Shengchang Zhang, Pengqing Liu, Jiadeng Zhu and Mengjin Jiang*

8891

Correction: Cartilage-inspired rapid *in situ* fabrication of seamless interlocked electrolyte–electrode interface for high-performance flexible supercapacitors

Yu Guo, Yinghui Shang,* Bingqian Jiao, Yuting Guo, Yujing Tang, Saiji Shen, Dongbei Wu, Xia Wang, Wenjun Li* and Qigang Wang*

RETRACTION

8892

Retraction: Selective synthesis of α-Fe_2O_3 thin films and effect of the deposition temperature and lattice oxygen on the catalytic combustion of propene

Patrick Mountapmbeme Kouotou, Zhen-Yu Tian,* Henning Vieker, André Beyer, Armin Gölzhäuser and Katharina Kohse-Höinghaus

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