

Journal of Materials Chemistry A

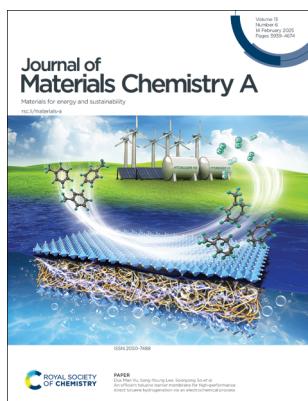
Materials for energy and sustainability

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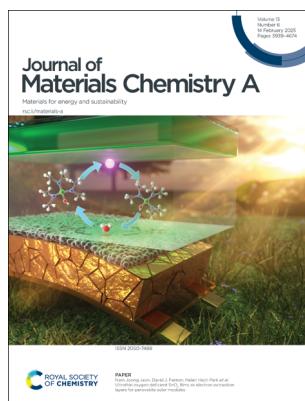
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See Duk Man Yu, Sang-Young Lee, Soonyong So et al., pp. 4090–4099. Image reproduced by permission of Soonyong So from *J. Mater. Chem. A*, 2025, **13**, 4090.



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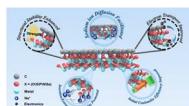
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Functional carbon-based covalent bridging bonds unlocking superior sodium-ion storage

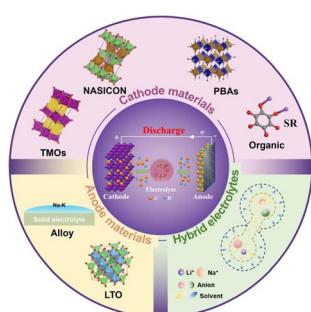
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Recent progress in alkali metal (Li/Na/K) hybrid-ion batteries: pioneering the future of energy storage

Yan Zhang, Rui Cao, Chen Ouyang, Libing Jiang, Yi Wang, Mei Yang* and Hui Xia*





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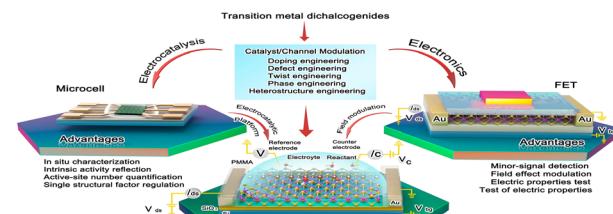
Fundamental questions
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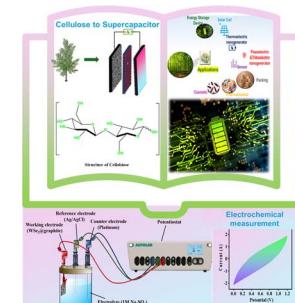
Chun Sun,* Longlu Wang,* Yuxing Liu, Hance Su and Peng Cui*



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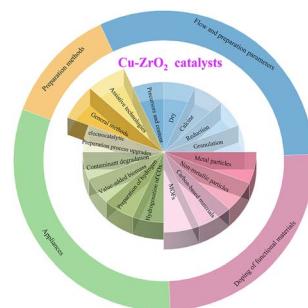
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Research progress in Cu–ZrO₂ catalysts: a systematic review of their preparation, doping, and applications

Yonglong Huang and Zhengkang Duan*

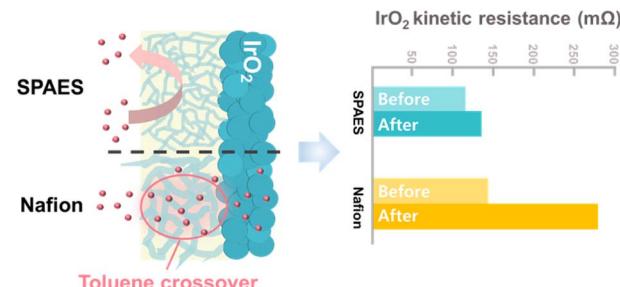


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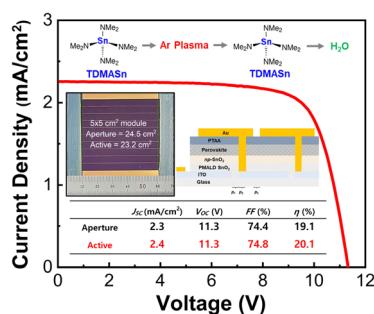
An efficient toluene barrier membrane for high-performance direct toluene hydrogenation via an electrochemical process

Chang Jin Lee, Taeseung Kim, Jaeheon Song, Sang Jun Yoon, Keun-Hwan Oh, Duk Man Yu,* Sang-Young Lee* and Soonyong So*



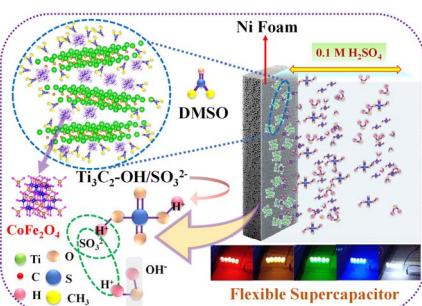
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**Ultrathin oxygen deficient SnO_x films as electron extraction layers for perovskite solar modules**

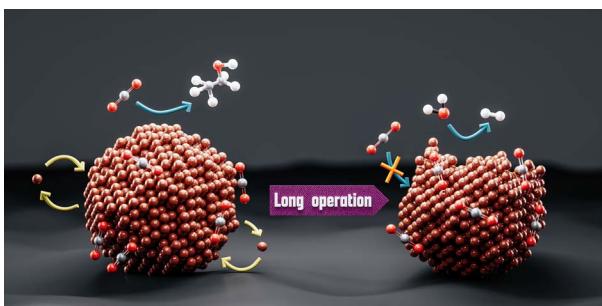
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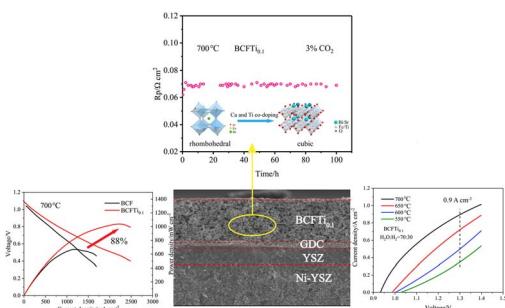
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**Incorporating high acidity cations in Co-free BiFeO_3 -based air electrodes for enhancing their electrocatalytic activity and durability in reversible solid oxide cells**

Shun Wang, Wen Jiang and Yifeng Zheng*

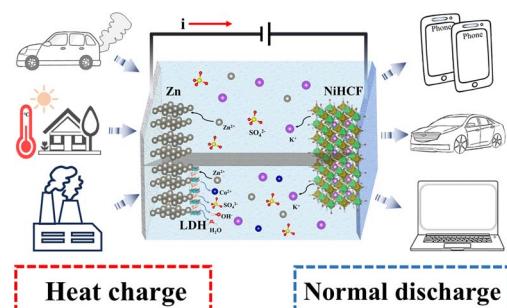


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Heat charging towards electrical energy saving and high-efficiency Zn-ion batteries

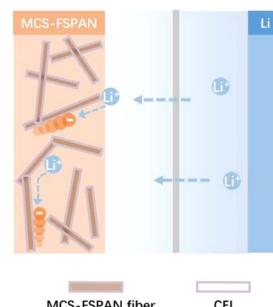
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Manganese cobalt sulfide-doped fibrous sulfurized polyacrylonitrile for high-rate and long-life lithium-sulfur batteries

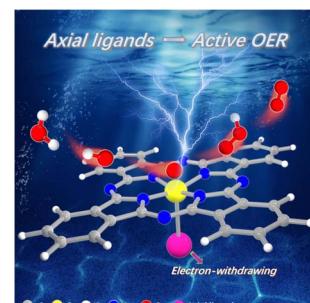
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Advancing oxygen evolution reaction efficiency in iron phthalocyanines: axial coordination as a key to structural and electronic tuning

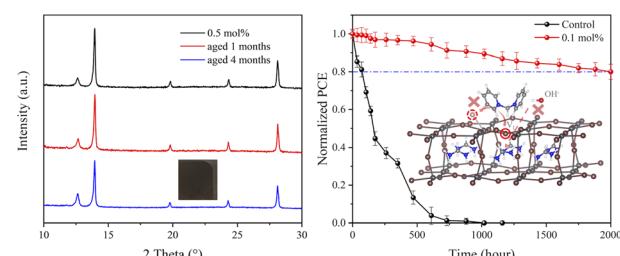
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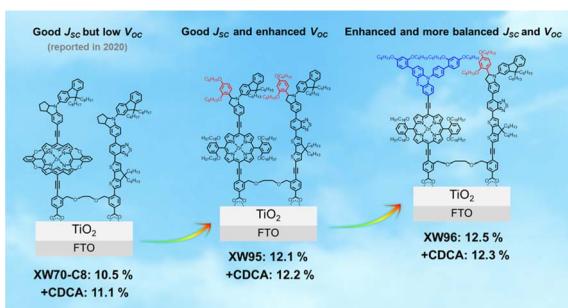
Moisture-resistant perovskite solar cells: the role of 1,1'-methylenebispyridinium dichloride in enhancing stability and performance

Yong Hu, Letian Dai,* Tianyu Sun, Haodan Shi, Ying Xu, Junyi Huang, Xiongjie Li, Yan Shen and Mingkui Wang*



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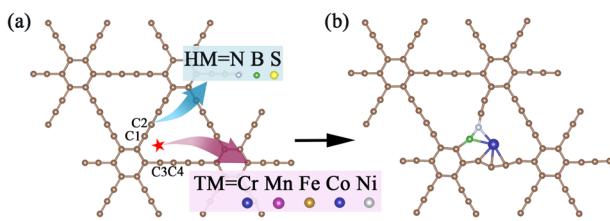
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Solar cells sensitized with doubly concerted companion dyes with optimized donors to achieve high efficiencies up to 12.5%: a record efficiency for iodine electrolyte-based DSSCs

Zhemin Li, Qingjun Lu, Yuqian Zhang, Qizhao Li, Wenjun Wu*, Shijun Li, Hailong Wang, Jianzhuang Jiang,* Chengjie Li* and Yongshu Xie*

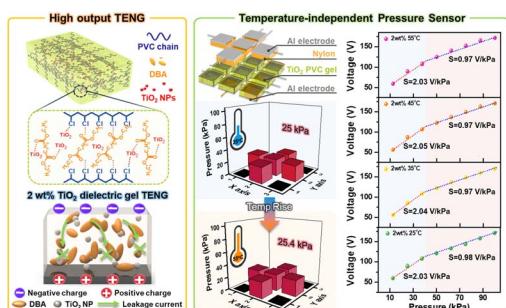
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Ying Zhao,* Shuai-Shuai Gao, Peng-Hui Ren, Li-Shuang Ma and Xue-Bo Chen*

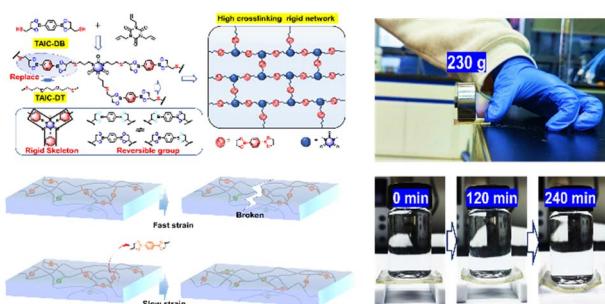
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High-output, thermally resilient Nano-TiO₂ dielectric gel triboelectric nanogenerator for energy harvesting and reliable temperature-independent pressure sensing

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Rigid-flexible dynamic polymers based on borate bonds

Jing Tu, Bo Chen, Xinhong Xiong, Weiming Xu and Jiaxyi Cui*

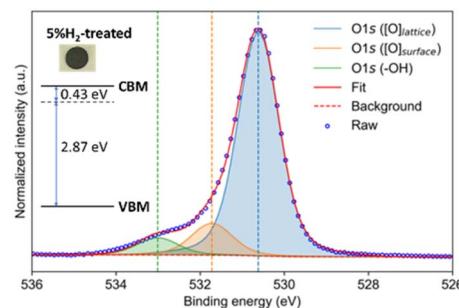


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Exploring the stability and protonic conductivity in W- and Mo-substituted LaNbO_4 under a reducing atmosphere

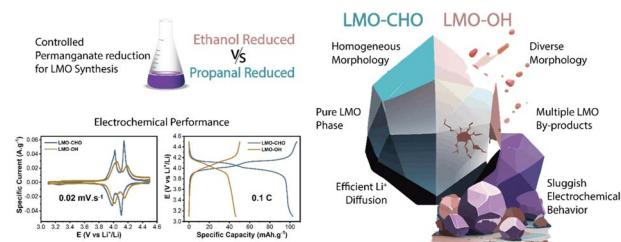
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Bridging the gap between manganese oxide precursor synthesis and lithium manganese oxide cathodes for high-voltage lithium-ion batteries

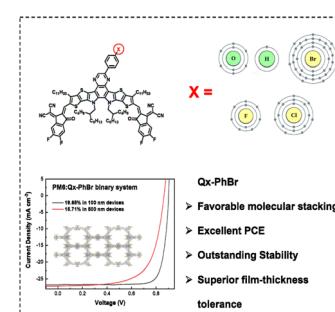
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Elucidating the effects of bromine substitution in asymmetric quinoxaline central core-based non-fullerene acceptors on molecular stacking and photovoltaic performances

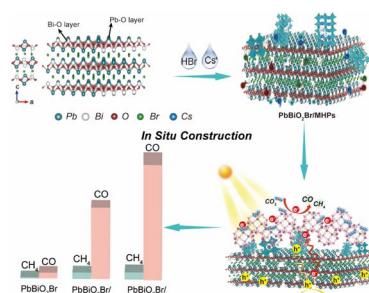
Dingding Qiu, Liting Zhang, Hao Zhang, Ailing Tang, Jianqi Zhang, Zhixiang Wei* and Kun Lu*



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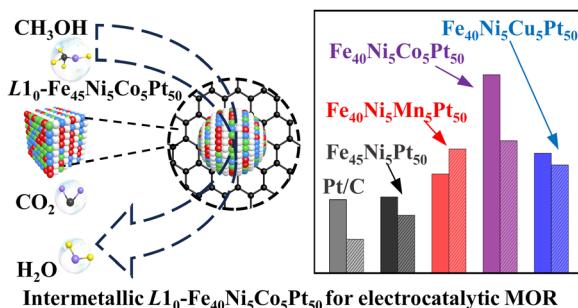
In situ construction and composition engineering of $\text{PbBiO}_2\text{Br}/\text{metal halide perovskite}$ heterojunctions for enhanced interfacial charge transfer and photocatalytic activity

Qi Qin, Wei-Qi Liu, Zhi-Hua Xia, Hong-Yan Chen* and Dai-Bin Kuang*



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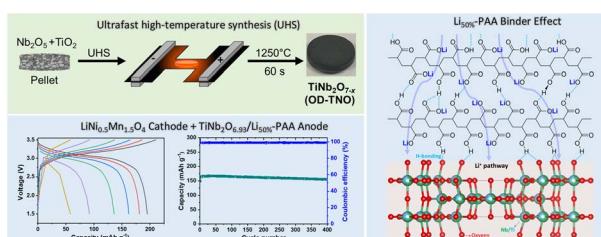
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Synthesis of intermetallic $L1_0$ - $Fe_{40}Ni_5M_5Pt_{50}$ ($M = Mn, Co, Cu$) nanoparticles for electrocatalytic methanol oxidation

Chun Wu,* Kankan Zhou, Mengyao Huang, Dekang Ding, Zhiqiang Ma, Runqing Liu and Wenli Pei*

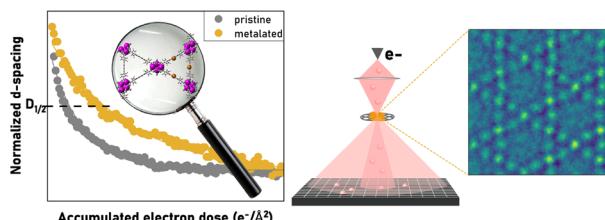
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Doosoo Kim, Siddhartha Nanda, Jong Heon Kim, Robson S. Monteiro, Luanna Silveira Parreira and Hadi Khani*

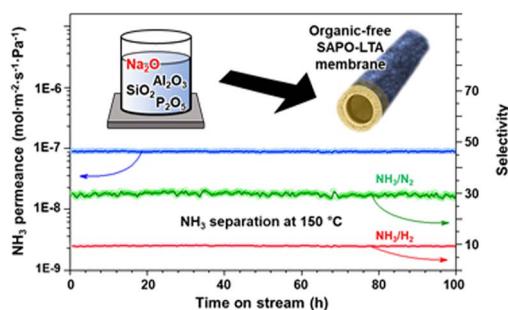
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Organic-free synthesis of silicoaluminophosphate zeotype membranes with tunable framework charge density

Sung Hwan Park, Bratin Sengupta, Saman Emami Gerami, Kaleb Friedman, Rumwald Lecaros, Amr F. M. Ibrahim and Miao Yu*

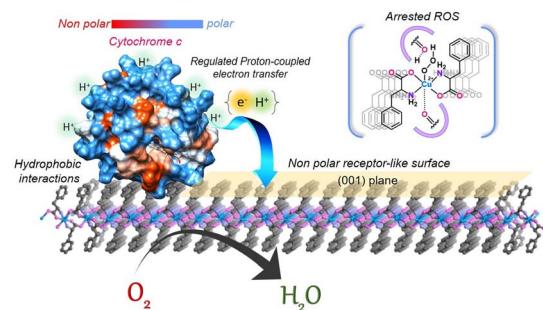


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A self-assembled nanzyme featuring precise active centers and topography exhibits controlled catalytic interplay with mitochondrial protein while regulating electron flow during bioinspired oxygen reduction

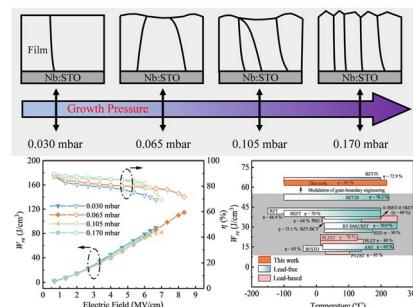
Adarsh P. Fatrekar and Amit A. Vernekar*



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High-energy density dielectric film capacitors enabled by grain boundary engineering

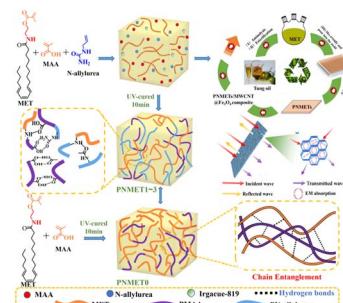
Yupeng Liu, Tian-Yi Hu, Ming Liu, Rui Lu, Lu Lu, Yiqin Lu, Qiuyang Han, Weijie Fu, Tingzhi Duan, Yanzhu Dai, Chunrui Ma,* Shao-Bo Mi* and Chun-Lin Jia



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Bio-based adaptable dynamically cross-linked networks and their composites: multiple stimulus responses and potential electromagnetic shielding applications

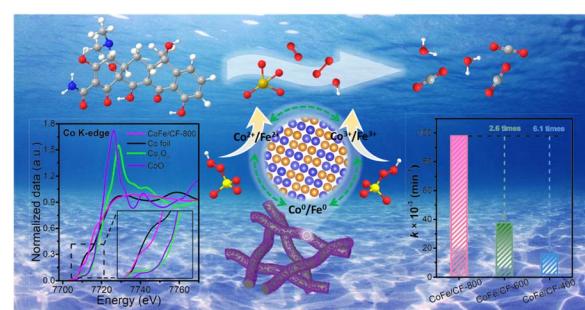
Yun Hu, Ye Sha, Lei Chen, Yufeng Ma, Qin Huang, Meng Zhang, Puyou Jia* and Yonghong Zhou



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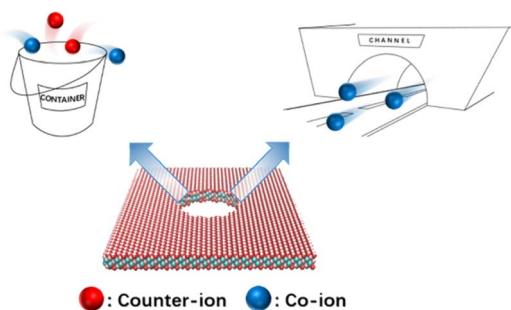
Anchoring Co–Fe alloy nano-grains on carbon fibers by an *in situ* alloying strategy to boost the catalytic performance for rapid oxidative degradation of emerging contaminants

Man Yang, Xianghan Cheng, Fengting Geng, Wenyuan Han, Ping Niu, Long Xie, Zhen Li, Yong-Zheng Zhang,* Da-Shuai Zhang, Jing Xu,* Xiuling Zhang and Longlong Geng*



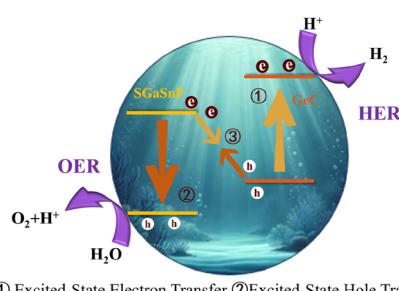
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**"Channel" or "container"? Effect of the pore structure on ion transport in porous MXene electrodes**

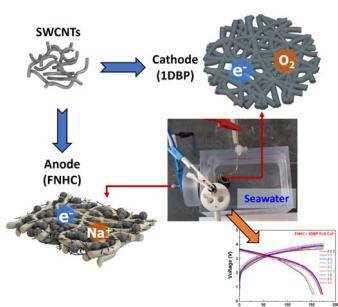
Kaiqing Sun, Shengze Ying, Xiao Tang, Yuling Zhao, Guohui Zhou* and Xiaomin Liu*

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**Enhancing photocatalytic water splitting via GeC/ SGaSnP Z-scheme heterojunctions with built-in electric fields**

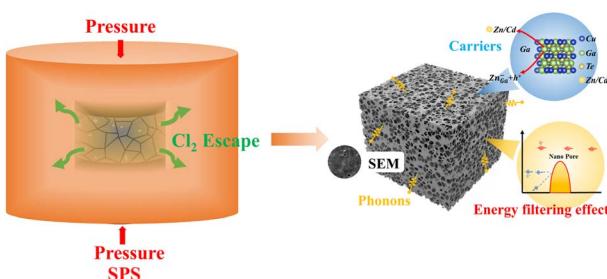
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**Advanced 1D SWCNT-interwoven hybrid electrode architecture for enhanced electrochemical performance in Na-seawater batteries**

Dae-Hyeon Jeong, Dowan Kim, Hyein Yu, Youngsik Kim, Yongil Kim* and Sang-Young Lee*

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**Simultaneously boosting electrical and thermal transport properties of CuGaTe₂ through XCl₂ (X = Cd, Zn) doping-driven band and defect engineering**

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Synergistically self-assembled *in situ* growth of MXene@MOF derived sodium alginate hydrogel 3D frameworks as next-generation electrocatalysts for oxygen and hydrogen evolution

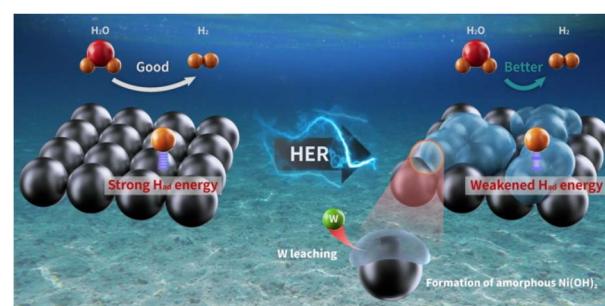
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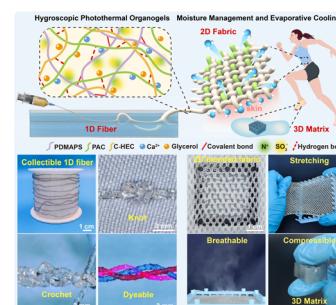
Ji Young Hwang, Yeonju Park, Young Mee Jung,^{*} Hyung-Kyu Lim^{*} and Duck Hyun Youn^{*}



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Tailor-made hygroscopic photothermal organogels for moisture management and evaporative cooling through a 1D-to-3D design

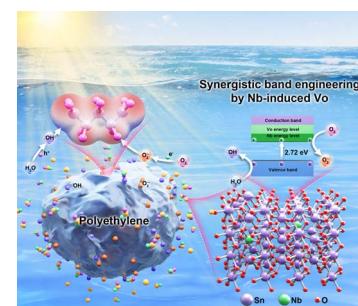
Yue Wang, Shuai Li, Jingjing Li, Yuke Sun, Zhaojun Li, Petri Murto, Zhihang Wang^{*} and Xiaofeng Xu^{*}



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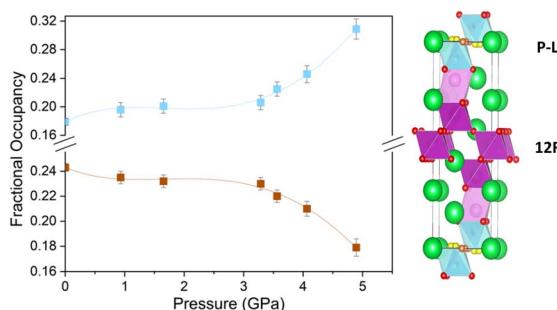
Synergistic dual-defect band engineering for highly efficient photocatalytic degradation of microplastics via Nb-induced oxygen vacancies in SnO₂ quantum dots

Jianqiao Liu, Dan Zhao, Xian Wu, Di Wu, Ningning Su, Yang Wang, Fang Chen, Ce Fu,^{*} Junsheng Wang^{*} and Qianru Zhang^{*}



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Tuning of the ionic conductivity of $\text{Ba}_7\text{Nb}_4\text{MoO}_{20}$ by pressure: a neutron diffraction and atomistic modelling study

V. Watson, Y. Zhou, D. N. Tawse, O. J. Ballantyne, C. J. Ridley, J. A. Dawson and A. C. McLaughlin*

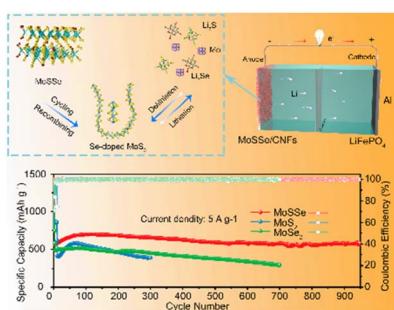
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Facilitating polysulfide conversion kinetics via multifunctional solid-state electrolytes under lean electrolyte conditions for lithium–sulfur batteries

Hyunji Park, Jooyoung Lee and Choongho Yu*

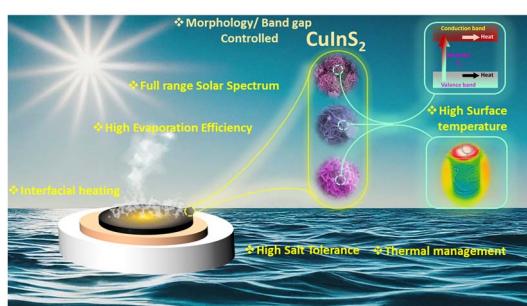
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Anchoring intermediate phases via few-layer MoSSe nanosheets in flexible porous carbon fiber for stable lithium ion storage

Mengluan Gao, Zhe Cui, Jinqi Zhu, Rujia Zou,* Wenqing Wang, Ye Chen* and Hufang Chen*

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Soft template-assisted design and synthesis of anisotropic 2D–3D CuInS_2 with a controlled morphology and band gap: exploring photothermal interfacial water evaporation

Ashok Barhoi, Bhagirath Mahto, Haider Ali and Sahid Hussain*

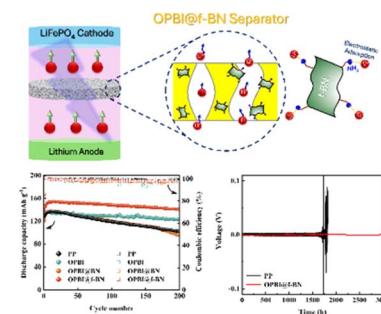


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Enhancing lithium metal battery safety and performance: a thermally stable poly(aryl ether benzimidazole) separator with 2D-functionalized boron nitride for 3000 hours lithium plating/stripping

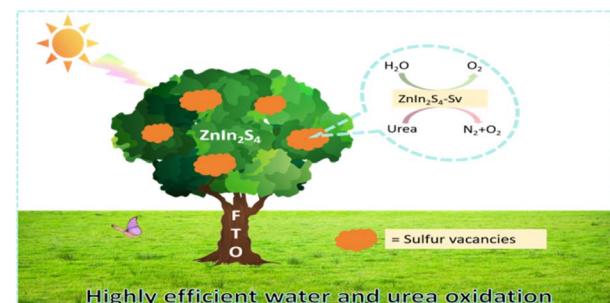
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Incorporation of sulfur vacancies in the ZnIn₂S₄ photoanode for highly efficient photoelectrochemical water splitting and urea oxidation

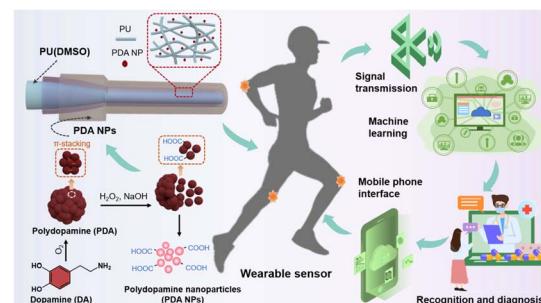
Peiyue Hu, Chuanyi Ruan, Jingjing Quan, Chenglong Li, Xingming Ning,* Pei Chen,* Zhongwei An and Xinbing Chen*



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Multi-channel wearable fiber sensors with high sensitivity for limb motion recognition

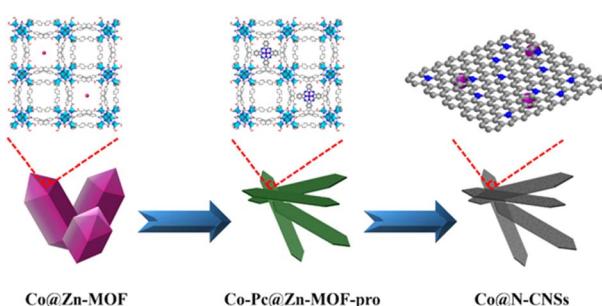
Wei Yan, Haonan Zhang, Xinxin Cai, Chenbin Ma, Dongmin Ma, Hongbo Lu,* Guanglei Zhang* and Weixing Song*



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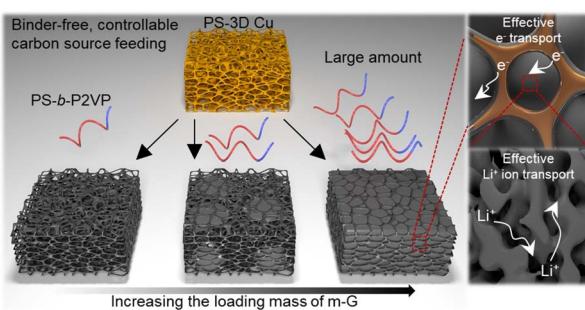
Size-confined Co nanoparticles embedded in ultrathin carbon nanosheets for enhanced oxygen electrocatalysis in Zn-air batteries

Yang Liu, Qi Yan, Fayuan Ge, Xinde Duan, Tingting Wu and Hegen Zheng*



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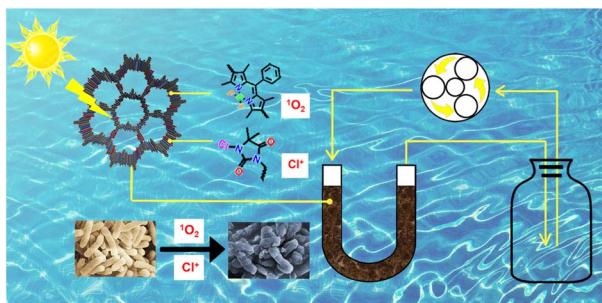
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Ultrahigh mass loading, binder-free synthetic approach for mesoporous graphitic carbon in 3D current collector for high energy lithium-ion batteries

Jun Kim, Keon-Woo Kim, Hyeongkeon Yoon, Shin Park, Dokyung Woo, Hangjun Jo, Changshin Jo* and Jin Kon Kim*

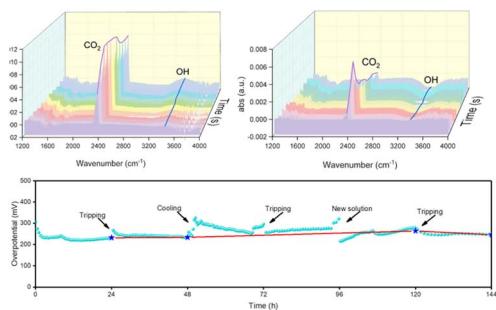
4530



BODIPY and *N*-halamine-decorated covalent organic framework with synergistic antibacterial capabilities for sunlight-powered water sterilization

Shuai Liu, Lin-Li Yao, Xin-Ru Wang, Guo-Yan Zhao, Fei Li, Bing-Jian Yao* and Yu-Bin Dong

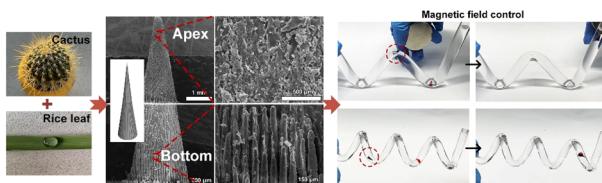
4538



Boosting hydrogen production from alkaline water splitting via electrochemical active surface reconstruction of transition metal sulfide electrocatalysts

Chenhuo Shi, Jing Zhou, Muzaffar Ahmad Boda, Kunfeng Zhao, Zhiqian Yang, Dingwang Yuan* and Zhiguo Yi*

4550



A magnetic-responsive conical microcolumn for removing oil pollution in tubes and emulsion filtering with ultra-high separation flux

Lei Kang, Yang Zhang, Yun-yun Song,* Yan Liu and Zhong-qiang Zhang

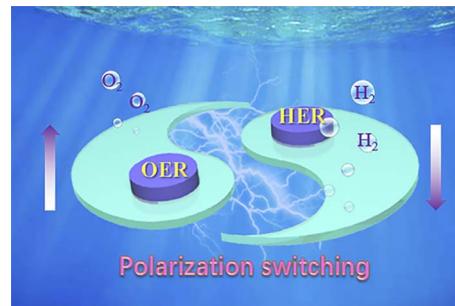


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4563

Ferroelectric switching driven photocatalytic overall water splitting in the As/In₂Se₃ heterostructure

Rui Xiong, Lili Zhang,* Cuilian Wen, Masakazu Anpo, Yee Sin Ang* and Baisheng Sa*



4576

Improving nitrate-to-ammonia conversion efficiency on electrodeposited nickel phosphide via surface δ-FeOOH modification

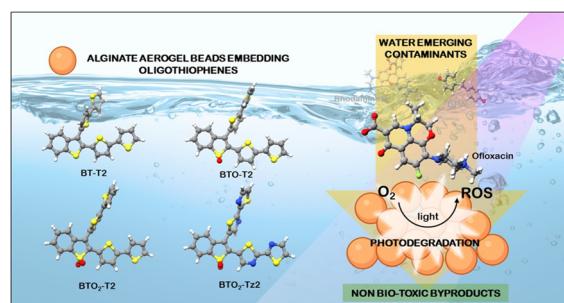
Anelisse B. Silva, Eduardo A. Reis, Jiajun Hu, Josep Albero, Cauê Ribeiro, Lucia H. Mascaro and Hermenegildo García*



4587

Alginate–oligothiophene aerogels as photocatalysts for the degradation of emerging organic contaminants in water

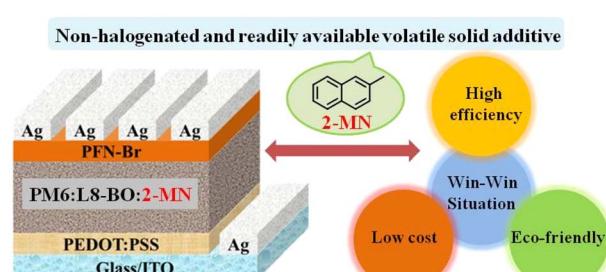
Andrea Trifoglio, Francesca Tunioli, Laura Favaretto, Massimo Zambianchi, Cristian Bettini, Ilse Manet, Livia Mariani, Anna Barra Caracciolo, Paola Grenni, Manuele Di Sante, Matteo Di Giosia, Tainah Dorina Marforio, Edoardo Jun Mattioli, Matteo Calvaresi* and Manuela Melucci*



4600

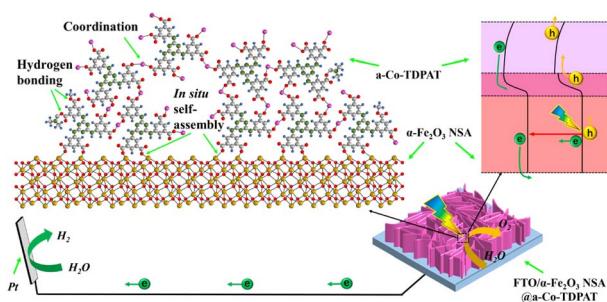
Methylated naphthalene additives with various melting and boiling points enable a win-win scenario of optimizing both cost and efficiency of polymer solar cells

Tao Li, Xiaoying Zhang, Qi Chen, Zhi-Guo Zhang,* Ping Shen* and Chao Weng*



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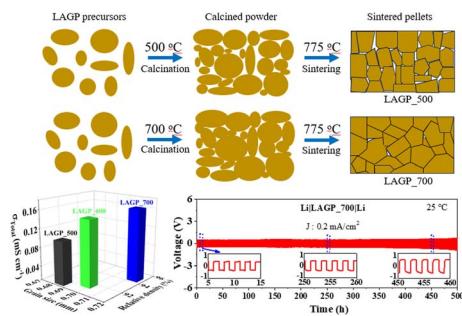
4614



In situ controllably self-assembled amorphous Co-TDPAT MOFs as superior cocatalysts of $\alpha\text{-Fe}_2\text{O}_3$ nanosheet arrays for highly efficient and ultrastable photoelectrochemical oxygen evolution

Weiguang Hu, Qinghua Xia, Lian Ying Zhang, Jianguo Lu, Qinggang He and Weiyong Yuan*

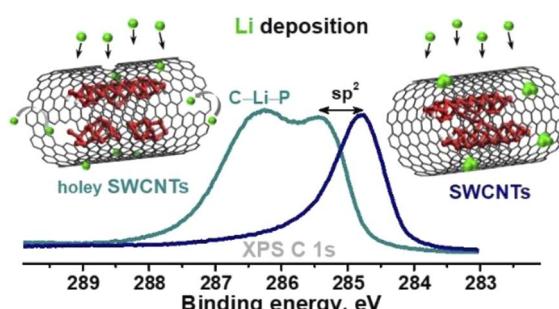
4624



Calcination-driven enhancement of LAGP for high-performance solid-state lithium metal batteries

Seo In Jung, Mohammad Nasir and Hee Jung Park*

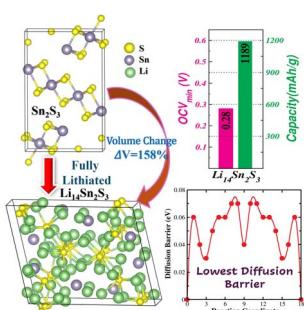
4634



Synergistic effect of sidewall holes and encapsulated phosphorus to improve lithium storage in single-walled carbon nanotubes

Anna A. Vorfolomeeva, Yuliya V. Fedoseeva, Elena V. Shlyakhova, Konstantin A. Kovalenko, Anna A. Makarova, Evgeny Yu. Gerasimov, Alexander V. Okotrub and Lyubov G. Bulusheva*

4650



High-performance Sn₂S₃ as a conversion-alloying anode material for lithium-ion batteries: insights from first-principles calculations

Dwaipayan Chakraborty,* Zubair Nabi Ganaie* and Priya Johari*



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4662

Enhancing oxygen activation toward promoted photocatalytic oxidation of methane to liquid oxygenates with $\text{ReO}_2@\text{TiO}_2$: the regulation of oxygen affinityLinghui Yan, Shuyue Wang,* Chao Qian
and Shaodong Zhou*