

Journal of Materials Chemistry A

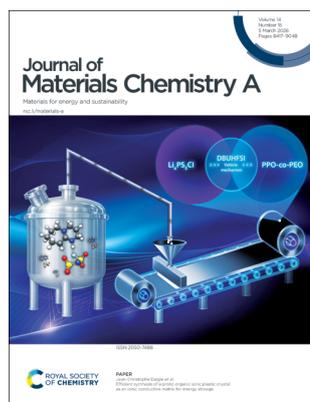
Materials for energy and sustainability

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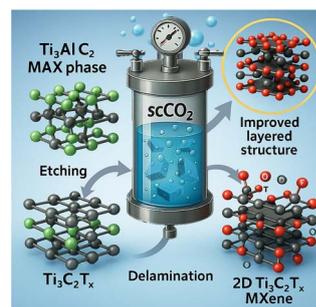
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See Süleyman Gökhan Çolak, Utku Bulut Simsek *et al.*, pp. 8433–8451. Image reproduced by permission of Süleyman Gökhan Çolak from *J. Mater. Chem. A*, 2026, 14, 8433. Cover image generated with AI.

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Greener and scalable MXene fabrication enabled by supercritical CO₂: a mini-review

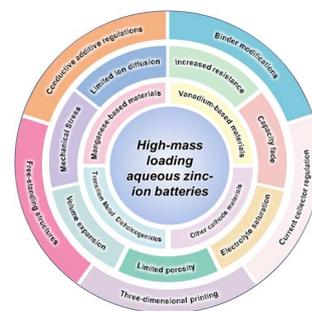
Süleyman Gökhan Çolak,* Utku Bulut Simsek,* Ahmet Güngör and Melis Özge Alaş Çolak



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A review on strategies toward high-mass-loading aqueous zinc-ion batteries

Yan Ran, Huaping Zhao and Yong Lei*



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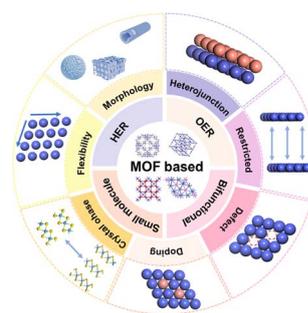


REVIEWS

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Recent advances in non-noble metal-based metal–organic frameworks as electrocatalysts for water splitting: challenges and future prospects

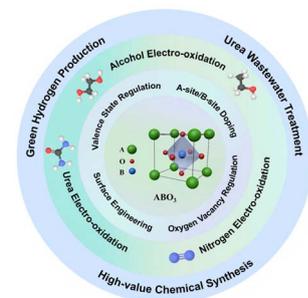
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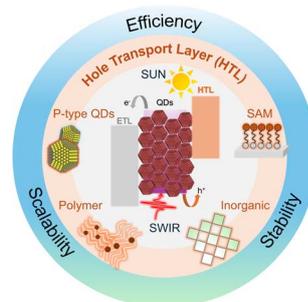
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Emerging hole transport layers for PbS quantum dot solar cells and photodetectors

Gomaa Mohamed Gomaa Khalaf, Fan Fang, Yongtao Zou,* Peter Müller-Buschbaum* and Wei Chen*

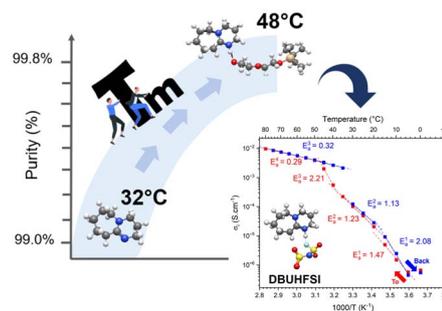


PAPERS

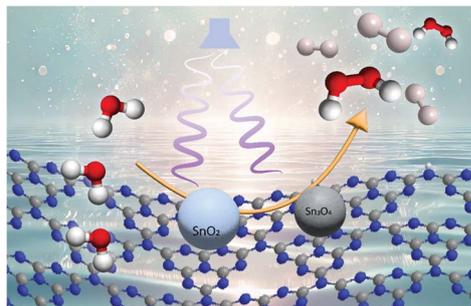
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Efficient synthesis of a protic organic ionic plastic crystal as an ionic conductive matrix for energy storage

Yasmine Benabed, Sergey Krachkovskiy, Benoit Fleutot, David Lepage, Chisu Kim, Sanjeet Kumar Singh, Abdessamia Rhazaoui, Sadollah Ebrahimi, Armand Soldera and Jean-Christophe Daigle*



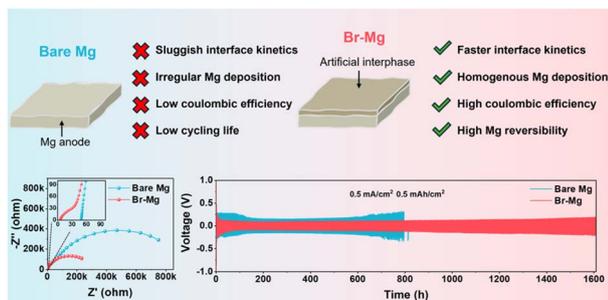
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Tin chloride metal salt modified carbon nitride for efficient hydrogen and hydrogen peroxide production from pure water via piezocatalysis

Ying Pan,^{*} Luo Cheng Liao, Dan Qiao, Irene Lamata Bermejo, Yunya Liu, Ran Su^{*} and Nieves López-Salas^{*}

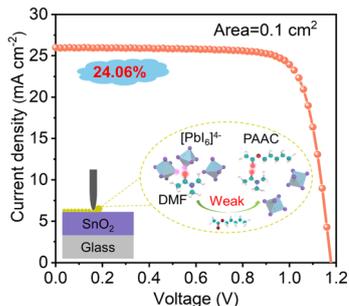
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A bromine-rich artificial interphase to regulate interfacial kinetics in boron-centered electrolytes for magnesium metal batteries

Deviprasath Chinnadurai,^{*} Gaoliang Yang,^{*} Sonal Kumar, Shengnan Sun, Jianbiao Wang, Zhenxiang Xing, Debbie Hwee Leng Seng, Zdenek Sofer and Zhi Wei Seh^{*}

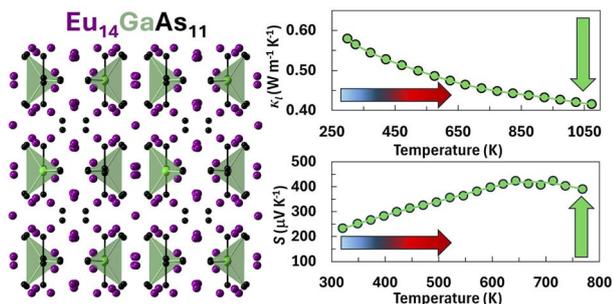
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Weakening solvation via dipole interactions enables efficient and stable perovskite solar cells

Shui Li, Han Qin, Mengnan Zuo, Wangbo Xu, Yingdong Xia, Lingfeng Chao^{*} and Yonghua Chen^{*}

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Ultra-low thermal conductivity and promising thermoelectric performance in the structurally complex Zintl phase: $\text{Eu}_{14}\text{GaAs}_{11}$

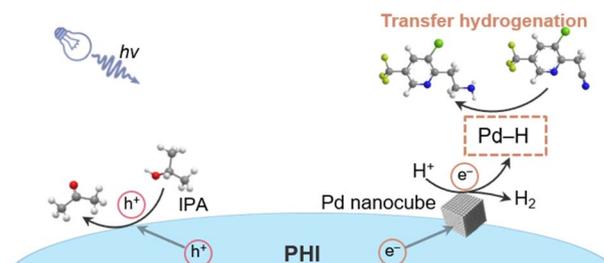
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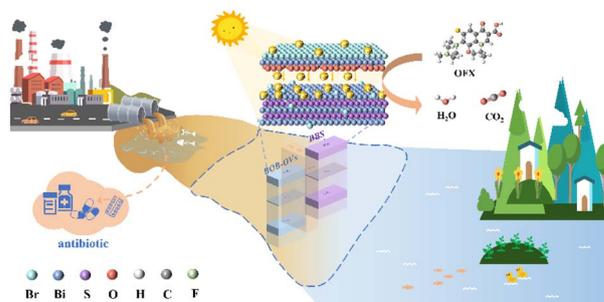
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Plasma lattice-matched interfacial engineering enables boosted photocatalytic O_2 activation for antibiotic degradation

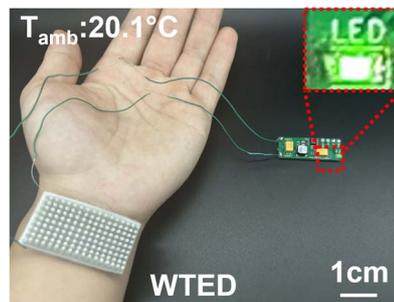
Junjie Chen, Zihan Fu, Zhimin Dong,* Zhiqing Lin, Yaoxuan Wang, Zifan Li, Youqun Wang, Zhibin Zhang,* Bin Han* and Yunhai Liu



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A high-performance wearable thermoelectric device with epoxy resin/PA/AlN composite heat sink

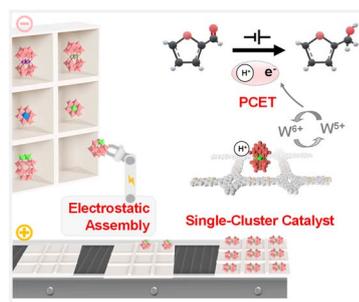
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Single-cluster polyoxometalate catalysts *via* modular electrostatic assembly on a cationic covalent organic framework for furfural electroreduction

Peng Lei, Weijie Geng, Hui Zhang, Peixuan Zhang, Jie Li, Jianxin Du, Yingnan Chi* and Changwen Hu



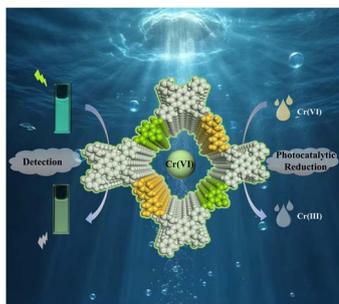
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Unlocking high-performance zinc batteries via haloacetamide-regulated nucleation and interface chemistry

Seul Gi Lee, Syryll Olidan, Laudimer Tye Tan, Kuk Young Cho,* Jihoon Kim* and Sukeun Yoon*

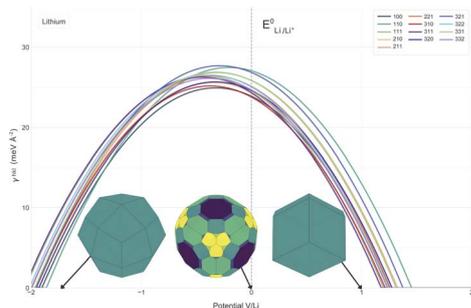
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Rational design of multivariate covalent organic frameworks with enhanced light-harvesting for selective detection and photocatalytic reduction of Cr(vi)

Zhenyu Lu, Xue Liu, Xiaohui Zhu,* Li Yang, Hao Lu, Binbin Zhang, Xing Kang,* Mingrong Yue and Yunjiang Yu*

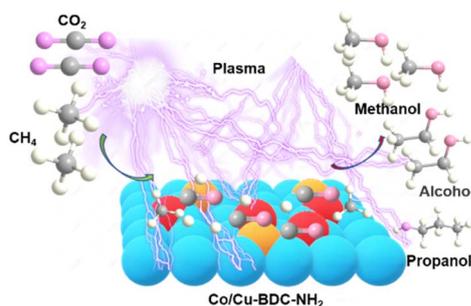
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Voltage-driven evolution of lithium nanoparticle morphology and SEI precursors

Brad Ayers, Arihant Bhandari, Gilberto Teobaldi and Chris-Kriton Skylaris*

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Highly selective one-step CO₂ conversion to liquid alcohols through plasma synergistic MOF catalysis

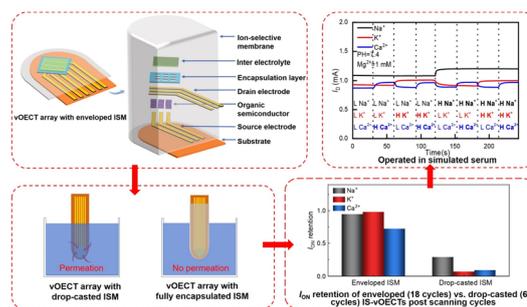
Chong Qi, Pengchen He, Yuan Gao, Dengke Xi, Yuxuan Xu, Liguang Dou, Li Lv, Cheng Zhang and Tao Shao*



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Enveloped ion-selective membranes for robust multi-ion sensing

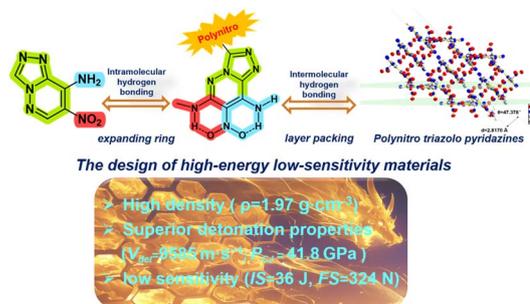
Xuefeng Zheng, Yixin Zhou, Qian Tian, Jinhao Zhou, Ziyi Deng, Xingyan Shu, Yue Wan, Dan Zhao and Wei Huang*



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Polynitro [1,2,4] triazolo [4,3-*b*] pyridazine: a building block for superior-performance energetic materials

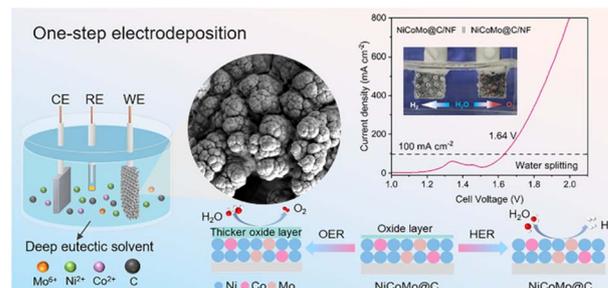
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A self-adaptive ternary NiCoMo-carbon composite as a bifunctional electrocatalyst for high-current-density water splitting

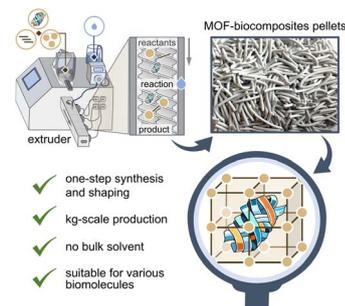
Yuchen Hao, Shujuan Wang,* Xuewen Xia, Yang Yang, Hao Zhang, Yuanman Ni, Xiaolu Xiong, Chao Jing, Tongshuai Wang, Jian-Qiang Wang, Linjuan Zhang and Xingli Zou



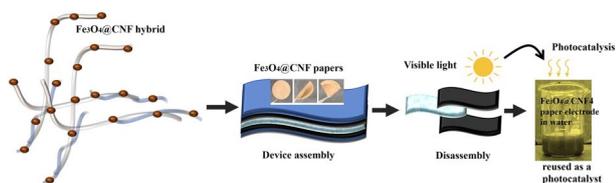
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ZIF-8-based biocomposites via reactive extrusion: towards industrial-scale manufacturing

Nikita Gugin, Alexander Schwab, Francesco Carraro, Isabella Tavernaro, Jana Falkenhagen, José Antonio Villajos, Paolo Falcaro* and Franziska Emmerling*



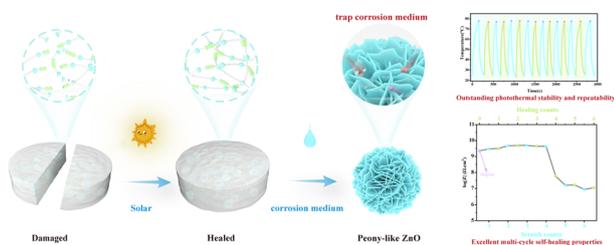
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Morphology-controlled Fe₃O₄@CNF nanocomposites for sustainable paper-based energy storage with recyclability

Iqra Rabani,* Tanveer Hussain, Ajeet Kumar, Ghulam Dastgeer, Faheem Maqsood, Karolien De Wael and Young-Soo Seo*

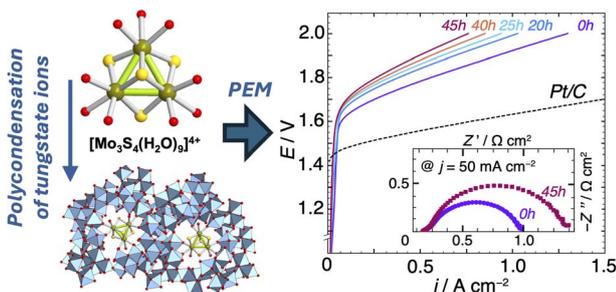
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Photosynthesis-inspired dual-mode self-healing coatings: leveraging peony-like ZnO for corrosion interception and energy harvesting

Yinxia Dong, Libo Tong,* Xiangjun Li, Miaomiao Li, Wenting Liu, Rongtao Wu, Xinyu Wang, Shiwei Xu and Kuishe Wang

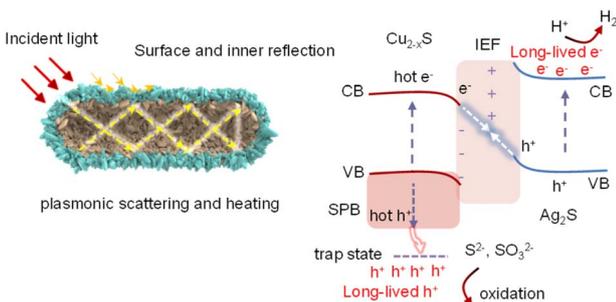
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Polymerized tungstate-molybdenum sulfide electrocatalysts for the hydrogen evolution reaction under acidic conditions

Maria El Khoueiry, Nathalie Leclerc, Haitham Maslouh, Mikhael Bechelany, Emmanuel Cadot, Clément Falaise* and Loïc Assaud*

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Plasmon-induced charge separation and accumulation in Ag₂S/Cu_{2-x}S S-scheme junction for broad-spectrum photothermal-assisted photocatalysis

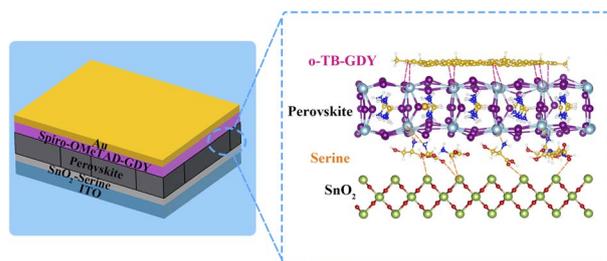
Wen-Xi Xia, Yi-Xin Dong, Zhe-Yuan Chen, Hai-Ting Li, You-Long Chen, Qing-Bo Liu, Si-Jing Ding, Qu-Quan Wang and Liang Ma*



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Nano-graphdiyne derivative and natural amino acid molecule as bilateral charge transport layer dopants for efficient perovskite solar cells

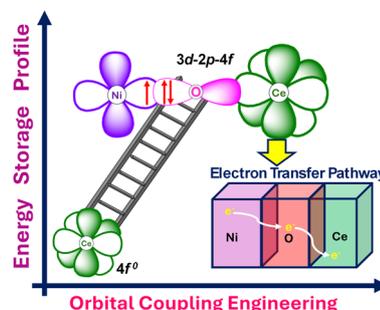
Yadong Wang,* Guilin Hu, Kaiyi Yang, Jiandong He, Cong Shao, Shengnan Fan, Jiabin Ma, Yu Yuan, Jizheng Wang and Yongjun Li*



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Shedding light on cerium(III/IV), the unsung hero, and mitigating its chemical inertness with Ni

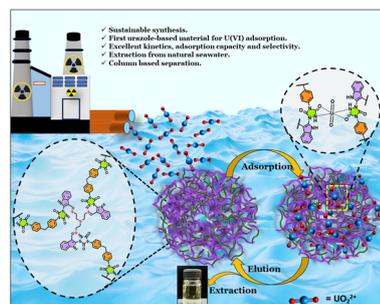
Antonyamy Dennyson Savariraj, P. Justin Jesuraj, Periyasamy Sivakumar, Jilly James, Kandasamy Prabakar and Hyun Jung*



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Urazole-decorated multifunctional mesoporous polymer networks for efficient capture of uranium(VI) from aqueous matrices

Aayush Anand, Suresh Tiwari, Soumen Ghosh, Ranga Subramanian and Subrata Chattopadhyay*



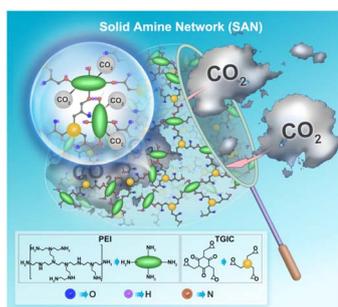
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Iodine-driven artificial SEI layer for high performance lithium metal batteries in an SO₂-based electrolyte

Jiwhan Lee, Seung Do Mun, Seong Hoon Choi and Hansu Kim*



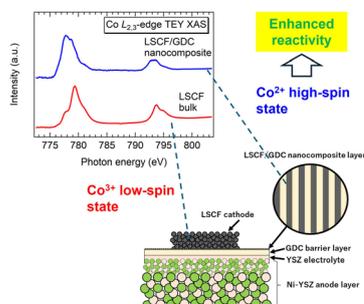
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Next generation solid amine sorbents for scalable direct air capture of carbon dioxide

Zhijian Wan,* Cameron White, Jason Czapla, Bobby Pejic, Wendy Tian, Durga Acharya, Sophia Surin, Wei Wu and Colin D. Wood*

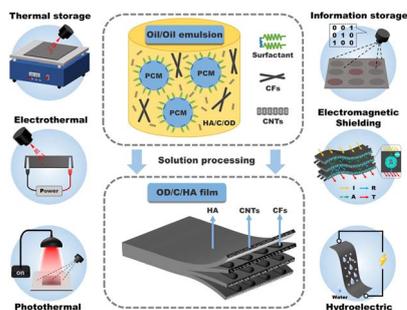
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Investigation of the interface structure and electronic state of nanocomposite $\text{La}_{0.6}\text{Sr}_{0.4}\text{Co}_{0.2}\text{Fe}_{0.8}\text{O}_{3-\delta}$ and $\text{Ce}_{0.9}\text{Gd}_{0.1}\text{O}_{2-\delta}$ electrodes for solid oxide fuel cells

Daisuke Asakura,* Tomohiro Ishiyama,* Eiji Hosono, Katherine Develos-Bagarinao, Katsuhiko Yamaji, Masaki Kobayashi, Miho Kitamura, Koji Horiba and Haruo Kishimoto

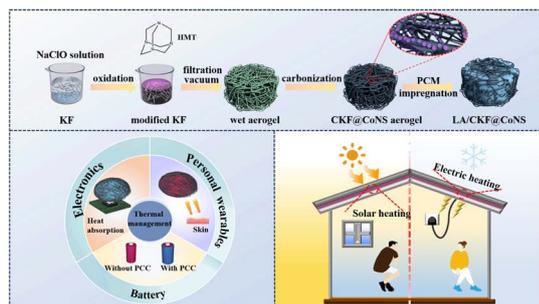
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Heterocyclic aramid-based phase-change films fabricated via the oil-in-oil emulsion technology with multiple energy conversion, thermal regulation, and electromagnetic shielding properties

Tan Jiaojun,* Xu Wenlong, Du Shengjing, Shu Guanrui, Zhang Meiyun, Song Shunxi, Yang Bin, Nie Jingyi and Zhang Jingru

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Multifunctional phase change composites enabled by structurally engineered carbon microtubule aerogels for efficient thermal energy conversion and storage

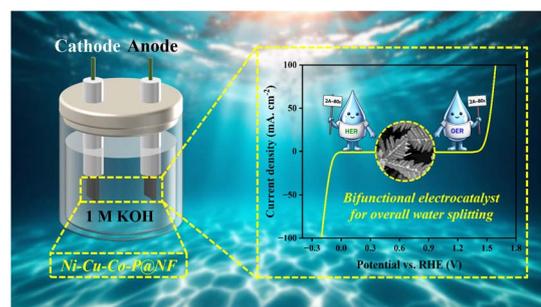
Shaokun Song, Runze Wang, Linda Lv, Rui Feng, Gangfeng Tan* and Lijie Dong*



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Synergistic engineering of a dendritic Ni–Cu–Co–P electrocatalyst *via* a dynamic hydrogen bubble template for efficient and durable bifunctional water splitting

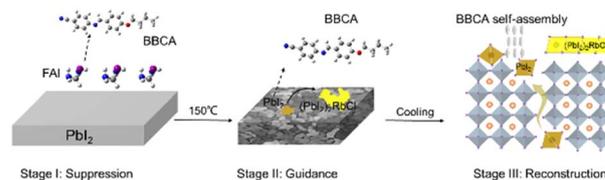
Ali Talebi, Ghasem Barati Darband,* Mostafa Mirjalili and Jinyang Li



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PbI₂ interface reconstruction suppresses ion migration for stable planar perovskite solar cells

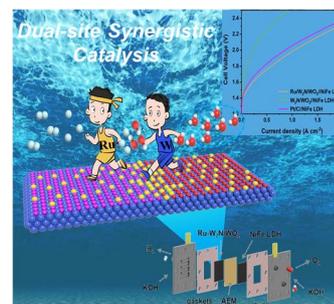
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Dual-site synergistic catalysis of a single atomic Ru and tungsten compound heterojunction for enhanced alkaline hydrogen evolution

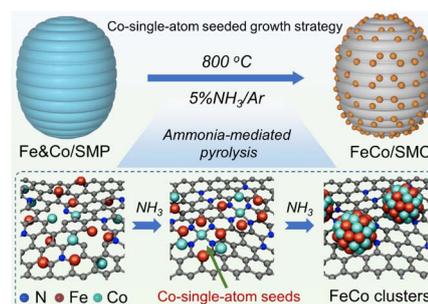
Wenjie Zhang, Jinhua Liu, Lingyun Li, Zizheng Fang, Huiyu Liu, Lei Yang* and Yunze Long*



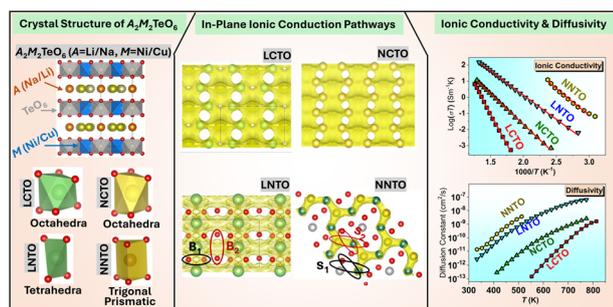
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Seed-mediated construction of bimetallic FeCo clusters on N-doped mesoporous carbon for bifunctional electrocatalysis in rechargeable Zn–air batteries

Yilun Zhao, Mengwei Duan, Zhengbin Tian,* Wenquan Wang, Xiaohui Deng, Bing Yu* and Guang-Hui Wang*



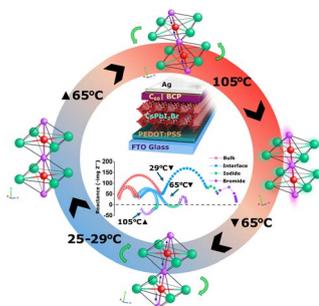
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Crystal structure driven electrical properties and mobile ion-dynamics of the layered compounds: $A_2M_2TeO_6$ ($A = Li/Na$ and $M = Cu/Ni$) family

Bikash Chandra Saha, Kuldeep Singh Chikara, Anup Kumar Bera* and Seikh Mohammad Yusuf*

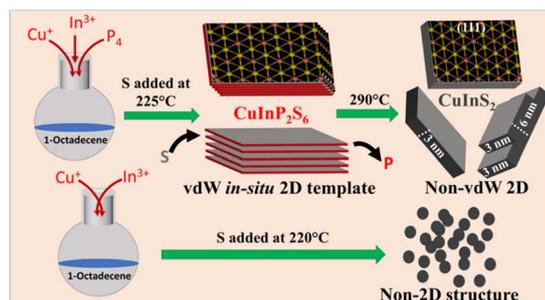
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Origin of thermal induced variation in performance and negative reactance of inorganic $CsPbI_2Br$ perovskite solar cells

Wei-Hsun Chiu, Saveen Senanayake, Le Pang, Xiaodong Wang, Minh Tam Hoang, Yang Yang, Chao Zhang, Deepak Dubal and Hongxia Wang*

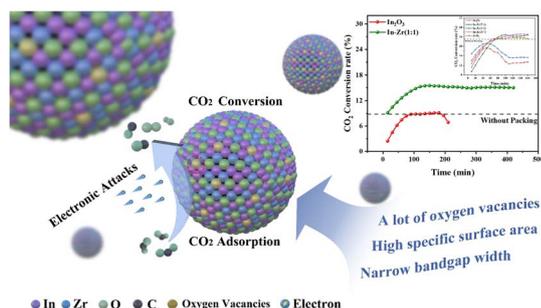
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In situ hard templating-assisted, facet-engineered, two-dimensional non-van der Waals $CuInS_2$ for efficient CO_2 reduction reaction

Shuvojit Mandal, Krishnendu Roy, Yatendra S. Chaudhary and Praveen Kumar*

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Oxygen vacancy-rich $In_2O_3-ZrO_2$ catalysts synthesized via DBD plasma for enhanced CO_2 -to- CO conversion

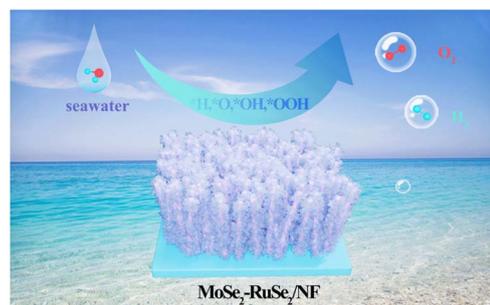
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Bifunctional and durable $\text{MoSe}_2\text{-RuSe}_2$ heterojunction catalyst for alkaline seawater splitting

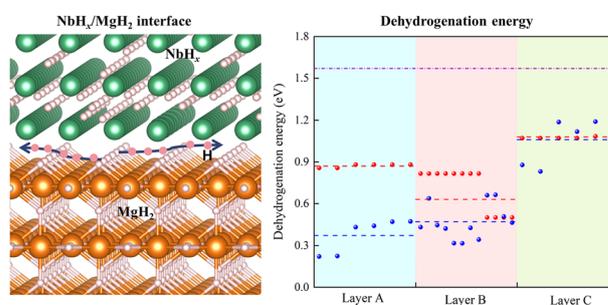
Shengqi Fan, Junhao Fu, Hongming Chen, Mengxiang Liu, Xueyan Zhang,* Lijie Luo* and Yongjun Chen*



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Revealing the effects of NbH_x ($x = 1, 2$)/ MgH_2 interfaces on the dehydrogenation of MgH_2 from first-principles

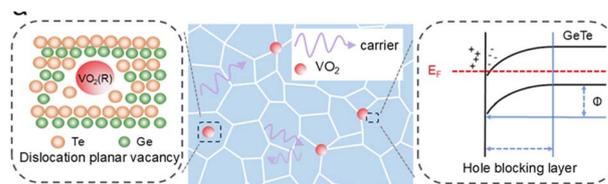
Yukun Liu, Jianchuan Wang,* Changbin Wei, Linkun Zhang, Bo Han and Yong Du



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Dynamic regulation of thermoelectric transport properties in GeTe via phase transition of VO_2

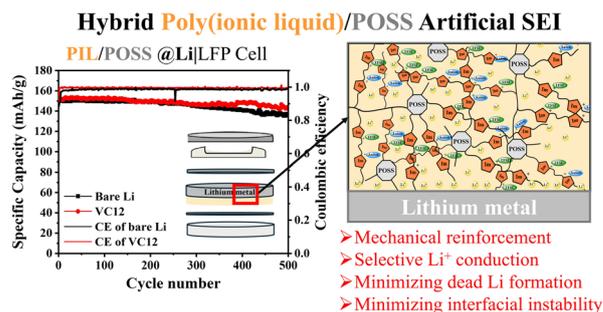
Danning Ma, Yuanxin Jiang, Yujie Huang, Songcheng Huang, Shuai Pan, Kai Guo* and Shuankui Li*

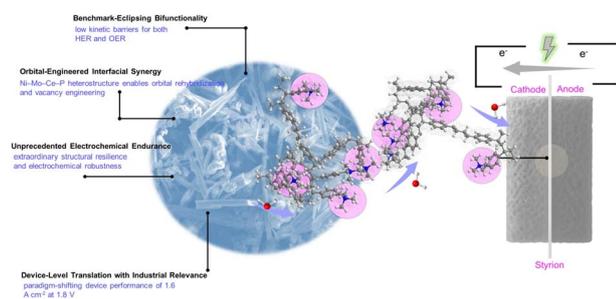


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Hybrid poly(ionic liquid)/polyhedral oligomeric silsesquioxane artificial solid electrolyte interphase for lithium metal batteries

Wei-Ting Chou, Thi-Ngoc Pham, Ta-Ching Yang, Yun-Jie Tsai, Hsisheng Teng and Jeng-Shiung Jan*





High-performance alkaline water electrolysis: a membrane–catalyst–device integrated paradigm

Shubham Mishra, Sarthak Mishra, Vartika Sharma, Debashish Sarkar and Vaibhav Kulshrestha*

