

Journal of Materials Chemistry A

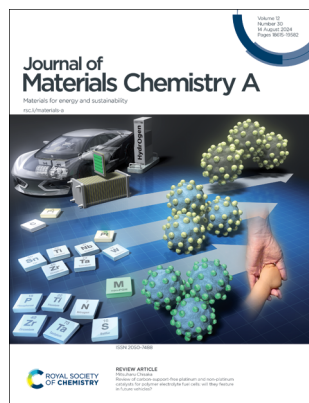
Materials for energy and sustainability

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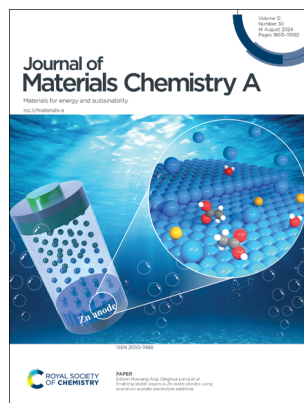
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ISSN 2050-7488 CODEN JMCAET 12(30) 18615–19582 (2024)



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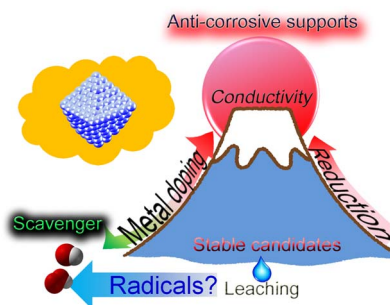
See Edison Huixiang Ang, Qinghua Liang *et al.*, pp. 18968–18976. Image reproduced by permission of Qinghua Liang from *J. Mater. Chem. A*, 2024, 12, 18968.

REVIEWS

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Review of carbon-support-free platinum and non-platinum catalysts for polymer electrolyte fuel cells: will they feature in future vehicles?

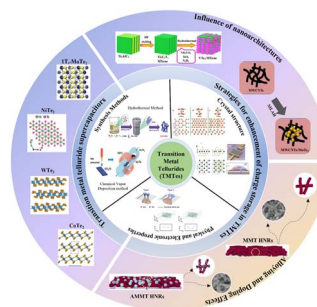
Mitsuharu Chisaka*



18674

A comprehensive review on advanced supercapacitors based on transition metal tellurides: from material engineering to device fabrication

Chumuiria Debbarma, Sithara Radhakrishnan, Sang Mun Jeong* and Chandra Sekhar Rout*



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Fundamental questions
Elemental answers

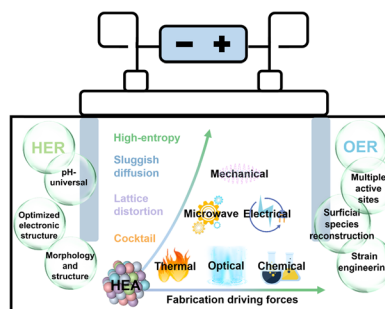


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Functional high-entropy alloys: promising catalysts for high-performance water splitting

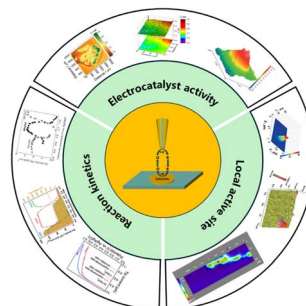
Weibo Zhang, Wei Yuan,* Xiaoqing Zhang,* Yuzhi Ke, Yaopeng Wu, Yafeng Bai, Simin Jiang and Yong Tang



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Recent advances in scanning electrochemical microscopy for probing the sites in electrocatalysts

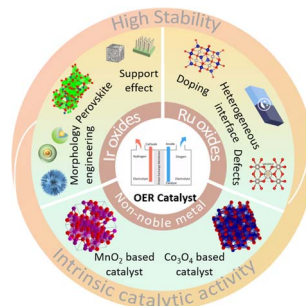
Jie Li, Heng Yang, Xiaofeng Gu, Yuqin Zou,* Dongping Zhan and Juan Peng*



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Balancing the relationship between the activity and stability of anode oxide-based electrocatalysts in acid for PEMWE electrolyzers

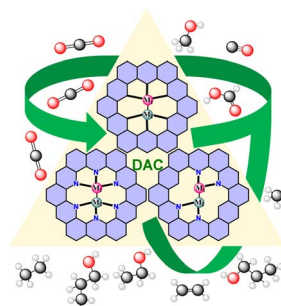
Yingying Xu, Yingxia Zhao, Zihui Yuan, Yue Sun, Shaomin Peng, Yuanhong Zhong, Ming Sun* and Lin Yu*



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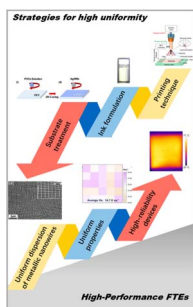
A synergic investigation of experimental and computational dual atom electrocatalysis for CO₂ conversion to C₁ and C₂₊ products

Saurabh Vinod Parmar, Damanpreet Kaur and Vidya Avasare*



REVIEWS

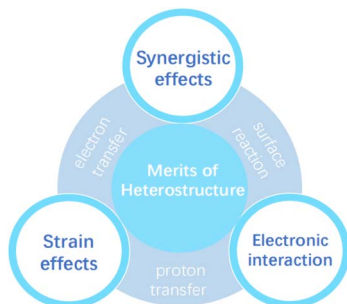
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Fabrication strategies for metallic nanowire flexible transparent electrodes with high uniformity

Su Ding, Junjie Chen, Ke Li* and He Zhang*

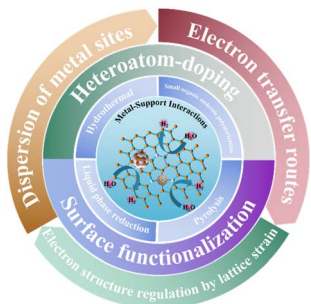
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Heterostructured electrocatalysts for the oxygen evolution reaction

Shao-Lan Zheng, Hui-Min Xu, Hong-Rui Zhu, Ting-Yu Shuai, Qi-Ni Zhan, Chen-Jin Huang and Gao-Ren Li*

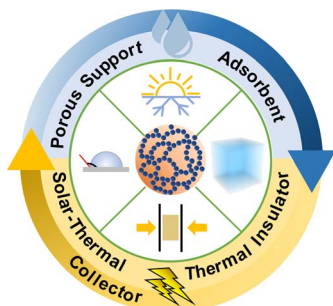
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Metal-support interactions of 2D carbon-based heterogeneous catalysts for the hydrogen evolution reaction

Weihaang Feng, Wei Zhang, Quanying Lin, Heshuang Zhang, Jingyuan Qiao, Linhong Xia, Nosipho Moloto, Wei He* and Zhengming Sun*

18879



Harnessing the power of silica aerogels for applications in energy and water sustainability

Ming Hang Tai* and Palaniswamy Suresh Kumar*

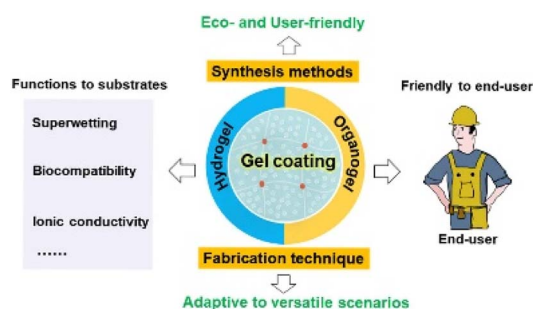


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Recent advances in gel coatings: from lab to industry

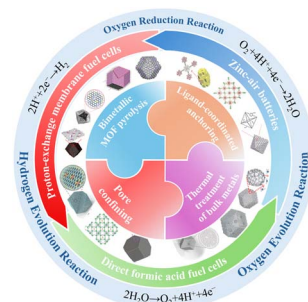
Lingling Zhang, Huili Ren, Liwei Wu, Zejun Liu, Ailin Xie, Xi Yao,* Jie Ju* and Mingjie Liu*



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Metal–organic framework-derived single-atom catalysts for electrocatalytic energy conversion applications

Mingjin Cui, Bo Xu, Xinwei Shi, Qingxi Zhai, Yuhai Dou, Guisheng Li, Zhongchao Bai, Yu Ding,* Wenping Sun,* Huakun Liu and Shixue Dou

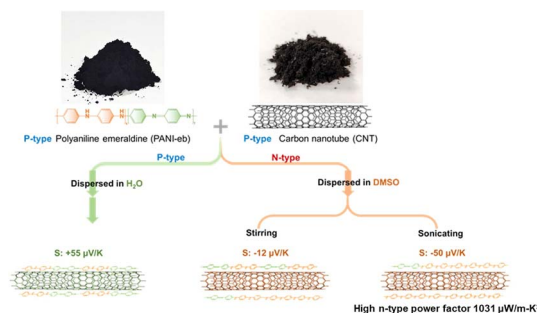


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Solvent effect induced charge polarity switching from p- to n-type in polyaniline and carbon nanotube hybrid films with a high thermoelectric power factor

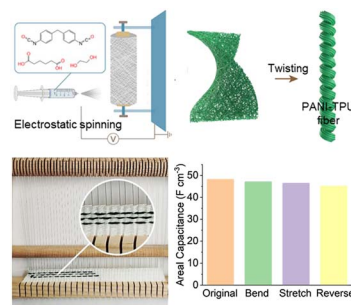
Yizhuo Wang, Xu Dai, Jiahao Pan, Jing Wang,* Xu Sun, Kuncai Li and Hong Wang*



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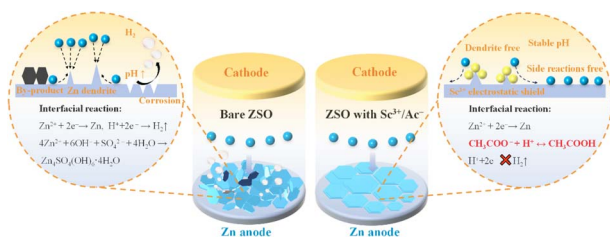
Stretchable flexible fiber supercapacitors for wearable integrated devices

Yujia Chen, Huihui Jin, Jiayu Zhang, Qirui Wu, Songjiu Han, Anbang Chen and Lunhui Guan*



PAPERS

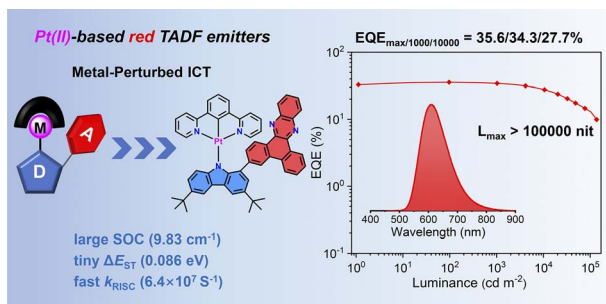
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Enabling stable aqueous Zn metal anodes using scandium acetate electrolyte additives

Chun Chen, Liansheng Li, Zuxin Long, Edison Huixiang Ang* and Qinghua Liang*

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A thermally activated delayed fluorescent platinum(II) complex for red organic light emitting diodes with high efficiencies and small roll-off

Jian-Gong Yang, Nengquan Li, Jiayu Li, Xiu-Fang Song, Ming-De Li,* Jingling Zhang and Kai Li*

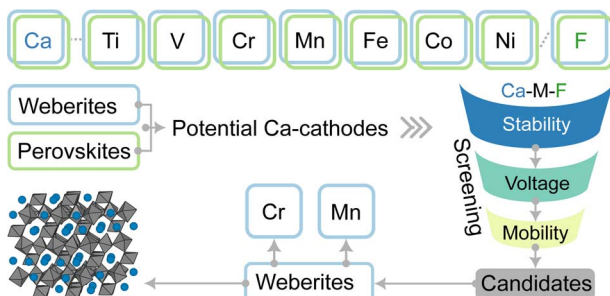
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Rationally designed dual cocatalysts on ZnIn₂S₄ nanoflowers for photoredox coupling of benzyl alcohol oxidation with H₂ evolution

Yu Wei, Yuzheng Wu, Jun Wang, Yong-Hui Wu, Zonglin Weng, Wei-Ya Huang, Kai Yang, Jia-Lin Zhang, Qi Li, Kang-Qiang Lu* and Bin Han*

18993



Fluoride frameworks as potential calcium battery cathodes

Dereje Bekele Tekliye and Gopalakrishnan Sai Gautam*

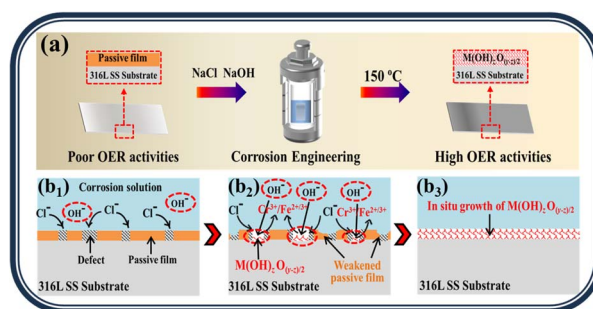


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In situ growth of an active catalytic layer on commercial stainless steel *via* a hydrothermal-assisted corrosion process for efficient oxygen evolution reaction

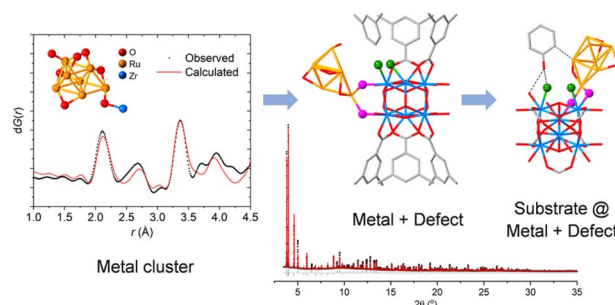
Jiuyang Xia, Jianghong Zhang, Kang Huang, Bowei Zhang,* Fei Wu, Yu Liang, Shuai Lu, Yizhong Huang* and Junsheng Wu*



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Direct visualisation of metal–defect cooperative catalysis in Ru-doped defective MOF-808

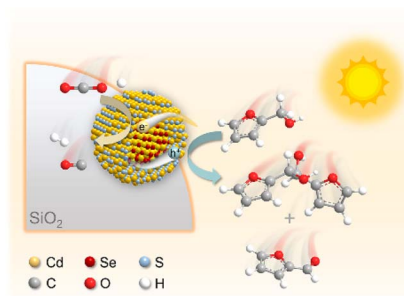
Chirui Xu, William Orbell, Guilian Wang, Boye Li, Bryan K. Y. Ng, Tai-Sing Wu, Yun-Liang Soo, Zhao-Xue Luan, Kangjian Tang, Xin-Ping Wu, S. C. Edman Tsang* and Pu Zhao*



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Engineering semiconductor quantum dots for co-upcycling of CO₂ and biomass-derived alcohol

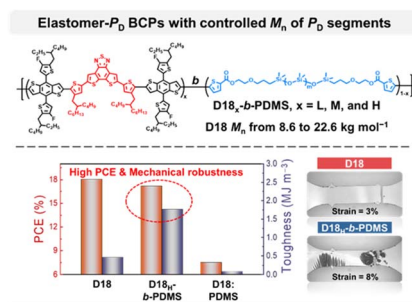
Lin-Xing Zhang, Zi-Rong Tang, Ming-Yu Qi* and Yi-Jun Xu*



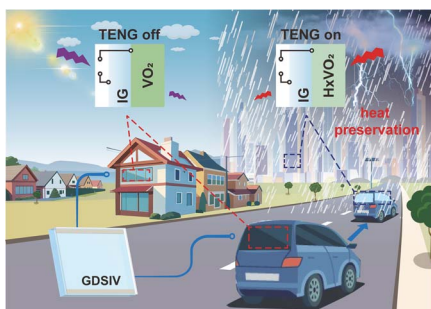
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The effect of rigid-block length in elastomer-containing photoactive block copolymers on the photovoltaic and mechanical properties of polymer solar cells

Heung-Goo Lee, Jin-Woo Lee, Eun Sung Oh, Michael J. Lee, Taek-Soo Kim,* Changyeon Lee* and Bumjoon J. Kim*



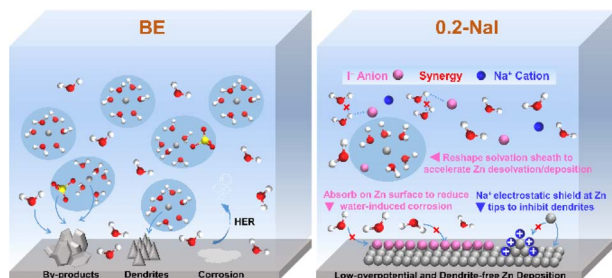
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Self-powered VO₂ phase transition based on triboelectric nanogenerator

Tianrui Dang, Junqing Zhao, Jianhua Zeng, Tianzhao Bu, Jiaodi Li, Yiming Dai, Zefang Dong, Yuan Feng, Yuanfen Chen* and Chi Zhang*

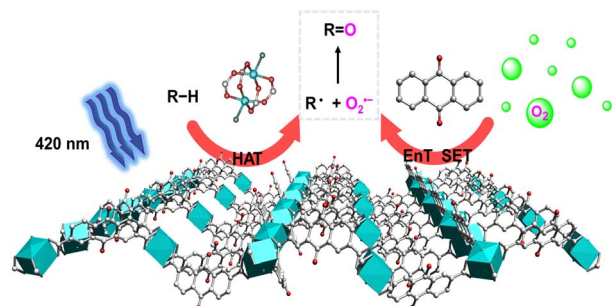
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Elucidating synergistic mechanisms of an anion-cation electrolyte additive for ultra-stable zinc metal anodes

Chenbo Yuan, Jin Xiao, Cong Liu and Xiaowen Zhan*

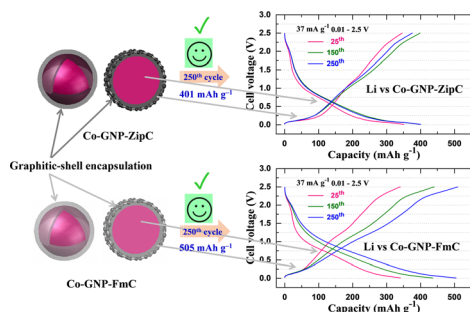
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In situ exfoliation of a copper-based metal-organic framework for boosting the synergistic photoactivation of inert C(sp³)-H bonds and oxygen

Huaqing Li, Songtao Liu, Guanfeng Ji, Cheng He, Yefei Wang, Hui Gao, Liang Zhao* and Chunying Duan

19081



Graphene triggered catalytic attack on plastic waste produces graphitic shell encapsulation on cobalt nanoparticles for ferromagnetism and stable Li⁺ ion storage

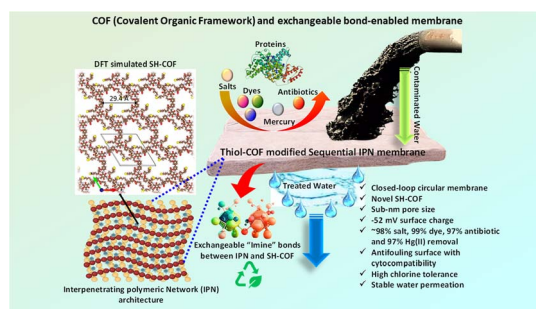
Manikandan Palanisamy,* Ramakrishnan Perumal, Di Zhang, Haiyan Wang, Olga Maximova, Leonid Rokhinson and Vilas G. Pol*



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Tuning the surface charge and pore size of IPNs arrests covalent organic nanostructures through *in situ* exchangeable bonds for the removal of persistent contaminants

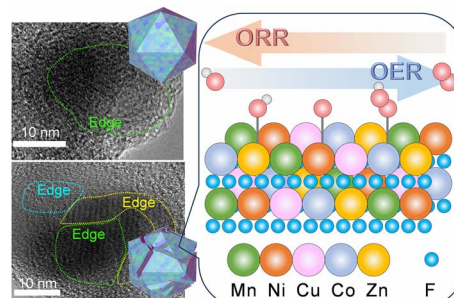
Ria Sen Gupta, Sk. Safikul Islam, Amit Malakar, Tridip Das and Suryasarathi Bose*



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Zinc-induced polycrystalline transformation of high-entropy fluorides and derived regulatory mechanisms for bifunctional oxygen electrocatalysis

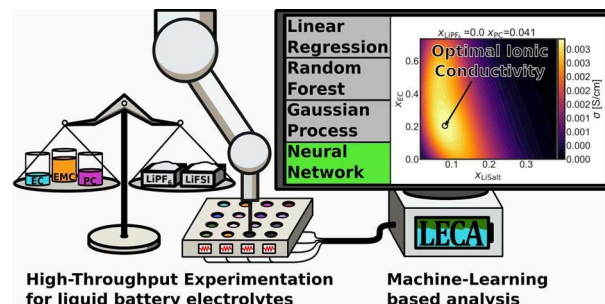
Gang Wang, Hao Chi, Yang Feng, Jie Fan, Nanping Deng,* Weimin Kang* and Bowen Cheng*



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Non-aqueous battery electrolytes: high-throughput experimentation and machine learning-aided optimization of ionic conductivity

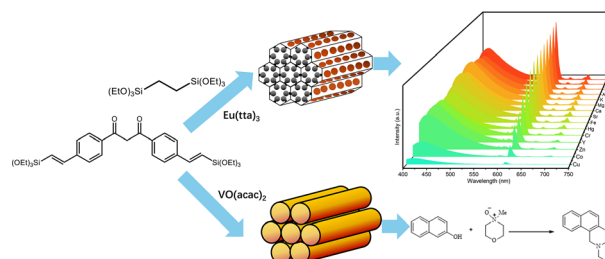
Peng Yan, Mirko Fischer, Harrison Martin, Christian Wölke, Anand Narayanan Krishnamoorthy, Isidora Cekic-Laskovic, Diddo Diddens, Martin Winter and Andreas Heuer*



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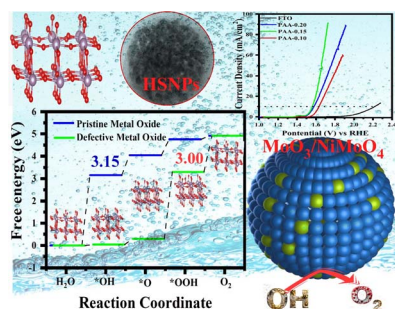
Acetylacetone functionalized periodic mesoporous organosilicas: from sensing to catalysis

Chunhui Liu, Mahdieh Haghighat, Himanshu Sekhar Jena, Dirk Poelman, Nathalie De Geyter, Rino Morent, Anna M. Kaczmarek* and Pascal Van Der Voort*



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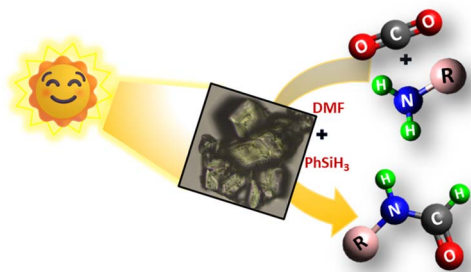
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Unveiling the impact of oxygen vacancies in engineered bimetallic oxides for enhanced oxygen evolution reaction: insights from experimental and theoretical approaches

Pratheep Panneerselvam, Chob Singh, Santhosh Kumar Jayaraj, Thamarainathan Doulassiramane, Ramanathan Padmanaban, Akshaya K. Samal, Sakar Mohan and Arvind H. Jadhav*

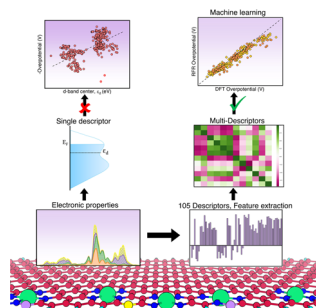
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A Keggin-based hybrid solid emerged as a promising candidate for CO₂-mediated photocatalytic N-formylation of amines

Parul Sood, Sakshi Bhatt, Harshita Bagdwal, Arti Joshi, Ashi Singh, Suman L. Jain* and Monika Singh*

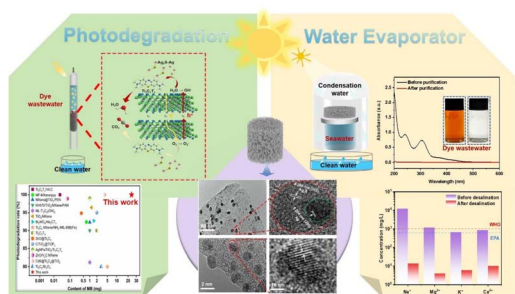
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Site specific descriptors for oxygen evolution reaction activity on single atom catalysts using QMML

Erakulan E. Siddharthan, Sourav Ghosh and Ranjit Thapa*

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An all-in-one aPAN/MXene@Ag-Ag₂S nanofibrous aerogel for efficient oil/water separation, solar interfacial evaporation and photocatalytic degradation of high-concentration dyes

Busaremu Wulayimujiang, Fang Guo, Qianyu Ma, Yong Wen, Yang Yang, Hongyan Huang, Quanpei Xie, Meng Shen, Jinxin Liu* and Si Cheng*

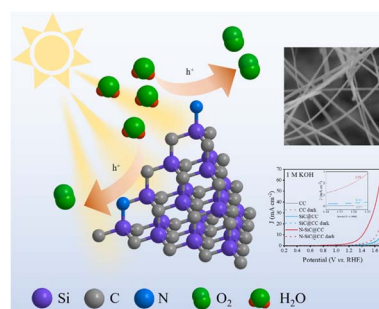


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Plasma-induced N doping and carbon vacancies in a self-supporting 3C-SiC photoanode for efficient photoelectrochemical water oxidation

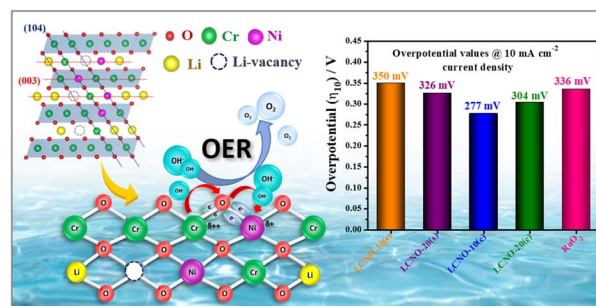
Linyi Wu, Shuchang Guan, Binghua Zhou,* Shien Guo,* Jie Wang, Ling Wu, Gan Jet Hong Melvin, Josue Ortiz-Medina, Mingxi Wang, Hironori Ogata, Masaki Tanemura, Yoong Ahm Kim, Mauricio Terrones, Morinobu Endo and Zhipeng Wang*



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Nickel-doped lithium-vacant layered $\text{Li}_y\text{Cr}_{1-x}\text{Ni}_x\text{O}_2$: a potentially active electrocatalyst for the oxygen evolution reaction

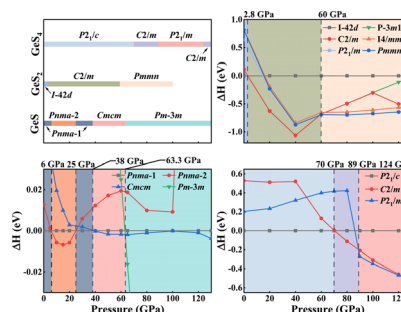
Vaishali Soni, Shraddha Jaiswal, Krishna Gopal Nigam, Preetam Singh and Asha Gupta*



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Structural stabilities, electronic structures, and superconductivity properties of $\text{Ge}_x\text{S}_{1-x}$ compounds under high pressure

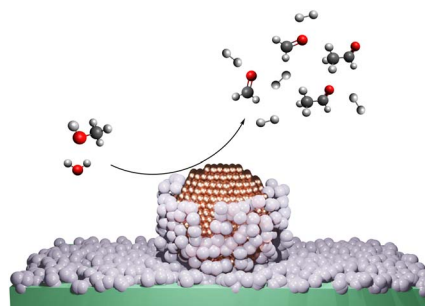
Yibo Sun, Bohan Cao, Xinwei Wang, Jiajin Chen, Defang Duan, Fubo Tian* and Tian Cui*



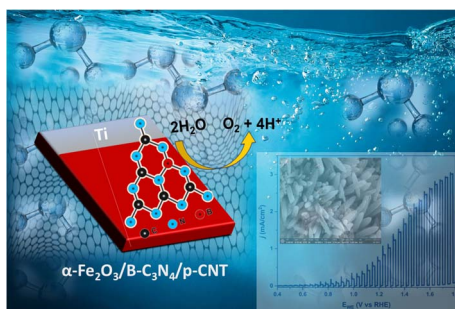
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Abnormal copper coordination obtained by a TiO_2 overlayer as the key to enhance photocatalytic hydrogen generation

Vien-Duong Quach, Maria Chiara Spadaro, Diana Dragoe, Marc Botifoll, Hervé Vezin, Christophe Colbeau-Justin, Franck Dumeignil, Jordi Arbiol, Robert Wojcieszak and Mohamed Nawfal Ghazzal*



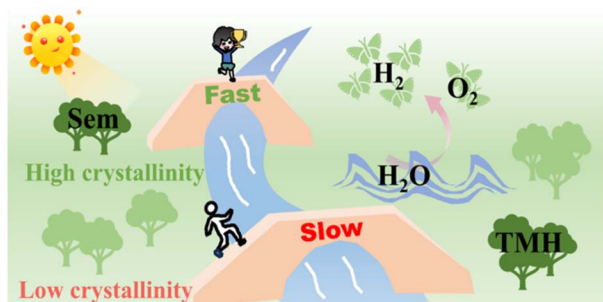
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Photoelectrochemical water splitting by hematite boosted in a heterojunction with B-doped g-C₃N₄ nanosheets and carbon nanotubes

Irfan Khan,^{*} Tímea Benkó, Anita Horváth, Shaohua Shen,^{*} Jinzhan Su, Yiqing Wang, Zsolt E. Horváth, Miklós Németh, Zsolt Czigány, Dániel Zámbo and József Sándor Pap

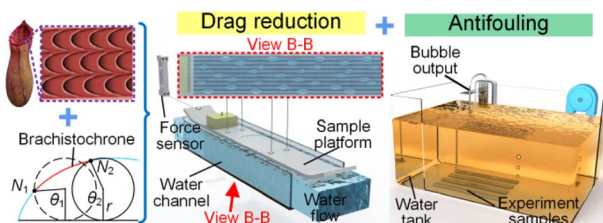
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Engineering the transition metal hydroxide–photoanode interface with a highly crystalline mediator for efficient photoelectrochemical water splitting

Meihua Li, Mujtaba Saqib, Li Xu, Chenglong Li, Jingjing Quan, Xingming Ning,^{*} Pei Chen,^{*} Qiang Weng, Zhongwei An and Xinbing Chen^{*}

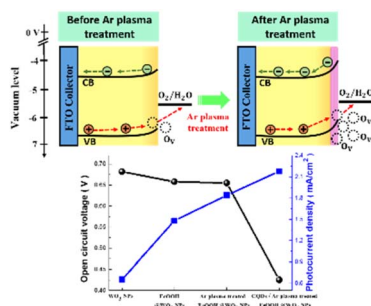
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Drag reduction and antifouling of a spontaneous fast moving air film

Defeng Yan, Junyi Lin, Bingzhen Zhang, Song Zhang, Siying Ling^{*} and Jinlong Song^{*}

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Co-modification of WO₃ nanoplates with β-FeOOH/carbon quantum dots combined with plasma treatment enables high-efficiency photoelectrochemical characteristics

Jui-Teng Lee, Zhi-Cheng Yan, Kuan-Han Lin, Po-Hsuan Hsiao, Pin-Chao Liao, Ying-Chih Pu and Chia-Yun Chen^{*}



Dual-benefit strategy for developing an efficient photodetector with prompt response to UV-near IR radiations: *in situ* synthesis and crystallization through a simple one-step annealing

One-Heating For Two-Synthesis & Crystallization

Efficient Photodetecting

EQE (%)

Wavelength (nm)

A competitive reaction strategy toward dielectric phases for enhancing electromagnetic wave absorption of polymer-derived ceramics

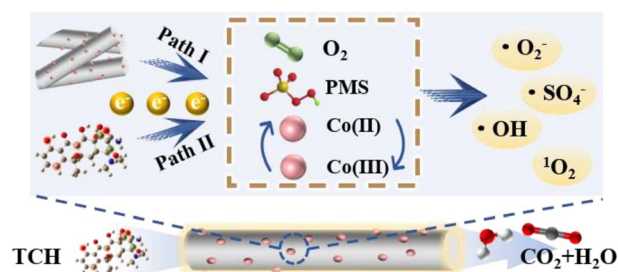
Molecule-bridged electron-selective contact for high-efficiency halide-based perovskite solar cells

Evaluating the impact of anodic oxidation reactions on water splitting using Prussian blue analog-derived metal-(oxy)hydroxides

The schematic shows a two-electrode system. The Cathode (left, teal) is labeled H_2 and H_2O . The Anode (right, purple) is labeled Fe-Co(O)OH and CoFe-PBA . A circuit with a battery symbol connects the two electrodes. To the right, a graph plots Current density (mA cm^{-2}) vs Potential vs RHE (V). The graph shows two curves: a green curve for NH_2NH_2 (labeled AOR, No OER) and a red curve for PhCH_2OH (labeled OER). The green curve shows a sharp increase in current density starting around 1.1 V, while the red curve shows a sharp increase starting around 1.4 V.

PAPERS

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Oxygen defect regulation and photocatalytic-oxymonosulfate activation of Co(II)/BiPO_{4-x} composites synergistically promoting medical waste degradation

Jiaying Zhang, Fan Fan, Wei Zhu, Wenqing Yao, Fupeng Zhao, Zhuang Yang, Cong Wang and Yajun Wang*

19344



Tri-functional Fe-based electrocatalyst with sturdy three-dimensional frame construction for the ORR, OER and HER

Haixia Liang, Jian Li, Jinli Zhang,* Wencai Peng,* Jun Li and Jichang Liu

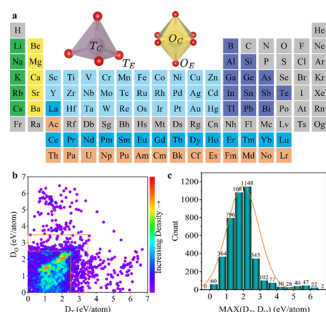
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Operando measurement of electrocatalyst potential on particulate photocatalysts for overall water splitting

Yudai Kawase, Keisuke Obata, Yuu Shioiri, Tomohiro Higashi and Kazuhiro Takanabe*

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Accelerating materials discovery for electrocatalytic water oxidation *via* center-environment deep learning in spinel oxides

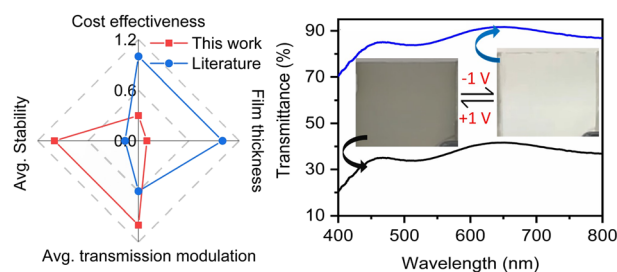
Yihang Li, Xinying Zhang, Tao Li, Yingying Chen, Yi Liu and Lingyan Feng*



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Ultrathin sputtered NiO films for enhanced electrochromic performance in smart windows

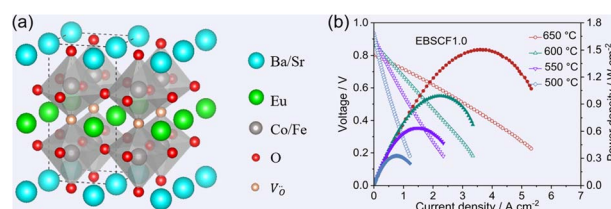
Ganesha Krishna V. S., Mukhesh K. Ganesha, Chirag Sarthi J., Hafis Hakkeem, Ashutosh K. Singh* and Giridhar U. Kulkarni*



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An acidity-regulated double perovskite cathode for efficient and durable power generation of intermediate-temperature solid oxide fuel cells

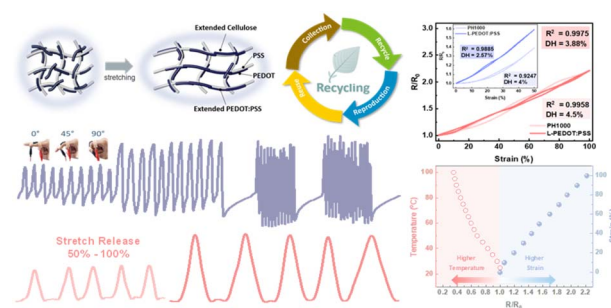
Aoqin Xu, Daoming Huan,* Pengqi Dai, Lu Zhang and Changrong Xia*



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Recyclable, ultralow-hysteresis, multifunctional wearable sensors based on water-permeable, stretchable, and conductive cellulose/PEDOT:PSS hybrid films

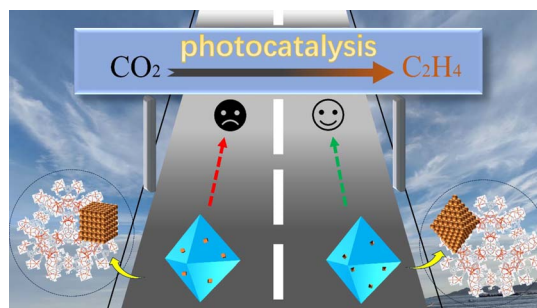
Anky Fitrian Wibowo, Saravanan Nagappan, Siti Aisyah Nurmaulia Entifar, Jung Ha Kim, Yulia Shara br Sembiring, Joo Won Han, Junghwan Oh, Guohua Xie, Jonghee Lee, Jincheol Kim, Dong Chan Lim, Myoung-Woon Moon, Min-Seok Kim, Soyeon Kim* and Yong Hyun Kim*



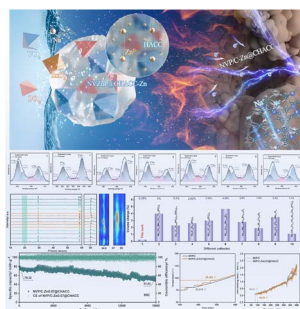
19414

Photocatalytic CO₂ reduction to C₂₊ products using a metal–organic framework composited with facet engineered Pd nanoparticles

Xiang-Yu Lu, Qiang Zhou, Xiao-Yu Zhang, Ya Zhang, Feng Gong* and Wei-Yin Sun*



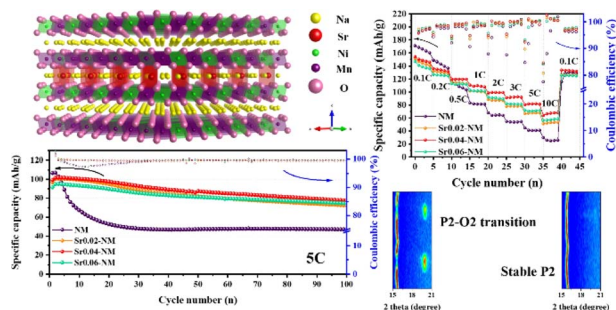
19422



Win–win strategy: zinc-ion anchoring crosslinked hydrogels and regulating electronic structure to achieve $V^{3+}/V^{4+}/V^{5+}$ redox reaction of $Na_3V_2(PO_4)_3$ with high thermal stability and zero strain characteristics

Tao Zhou, Baofeng Zhang, Shengnan He, Yaxiong Yang, Chao Zheng, Yanzhong Wang, Li Guo and Yanjun Chen*

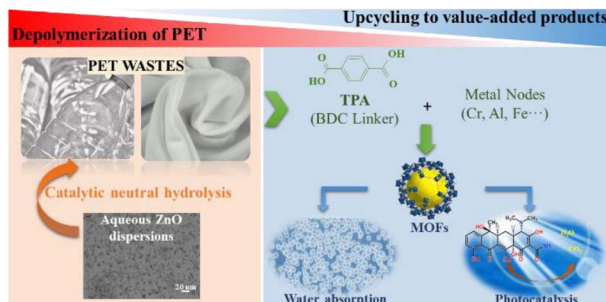
19440



Mitigating the Jahn–Teller distortion and phase transition in the $P2-Na_{0.67}Ni_{0.33}Mn_{0.67}O_2$ cathode through large Sr^{2+} ion substitution for improved performance

Xilong Zhang, Fei Xie, Xuejie Wang, Tao Liu, Liuyang Zhang* and Jiaguo Yu*

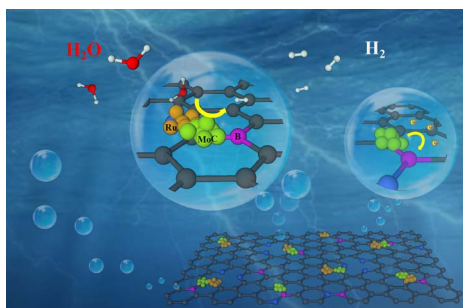
19452



Upcycling plastic wastes into high-performance nano-MOFs by efficient neutral hydrolysis for water adsorption and photocatalysis

Ling-Xia Yun, Meng Qiao, Bin Zhang, Hang-Tian Zhang and Jie-Xin Wang*

19462



Interfacial modulation of Ru catalysts using B, N co-doped porous carbon-confined MoC quantum dots for enhanced hydrogen evolution reaction performance

Shumin Xie, Mang Niu, Xingyun Li,* Yang Lei, Huanfang Zhang, Shuai Xu, Deyu Wang, Sameh M. Osman, Zhi Peng and Yusuke Yamauchi*

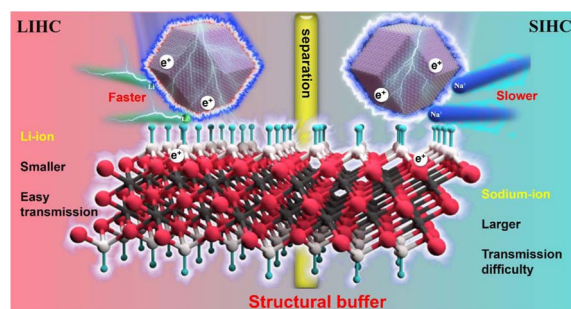


PAPERS

19470

Hierarchical architecture composites of N-doped hollow polyhedra anchored on $\text{Ti}_3\text{C}_2\text{T}_x$ nanosheets for advanced lithium-ion and sodium-ion capacitors

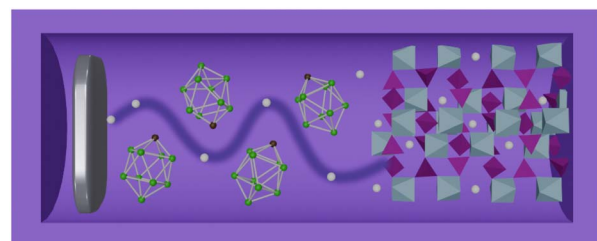
Wenling Wu,* Jiahao Diwu, Jiang Guo, Yuan Fang, Lei Wang, Chenguang Li, Qing Wu and Jianfeng Zhu



19485

Sodium decahydrido-*closo*-1-carbadecaborate as a solid electrolyte: new insight into polymorphism and electrochemical performance

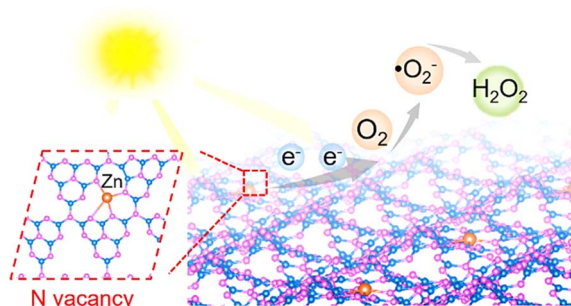
Therese S. S. Kjær, Jakob B. Grinderslev, Lasse N. Skov and Torben R. Jensen*



19497

N vacancies modulated Zn single atoms for efficient H_2O_2 photosynthesis

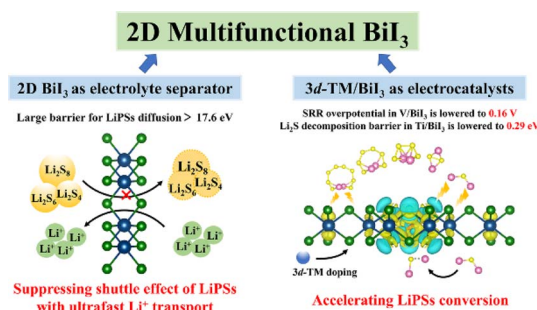
Wenke Xie, Junyu Liu and Xuan-He Liu*



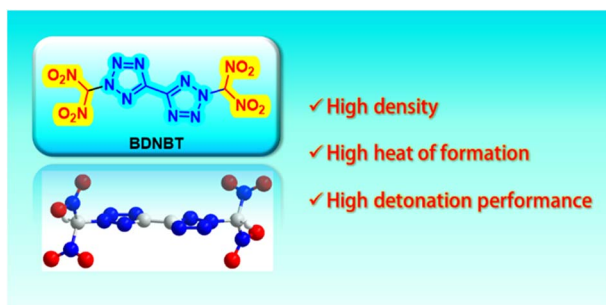
19504

Theoretical probing of monolayer BiI_3 as an electrolyte separator and 3d-TM-doped BiI_3 as electrocatalysts toward high-performance lithium-sulfur batteries

Wentao Wu, Kaixin Zou, Li Wang, Boyan Li,* Wen Yang, Chunlai Gao, Feng Lu,* Weichao Wang and Wei-Hua Wang*



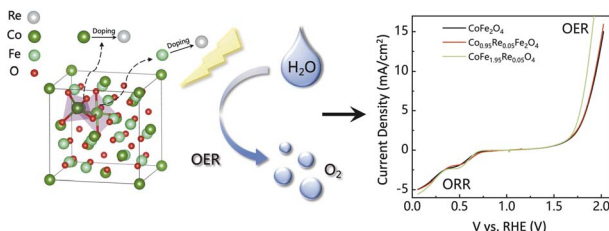
19513



Intramolecular assembly of dinitromethyl and bistetrazole: a strategy for constructing advanced and environmentally friendly high-energy density materials

Xuezhi Yu, Jie Tang, Caijin Lei, Chungui Xue, Guangbin Cheng,* Chuan Xiao* and Hongwei Yang*

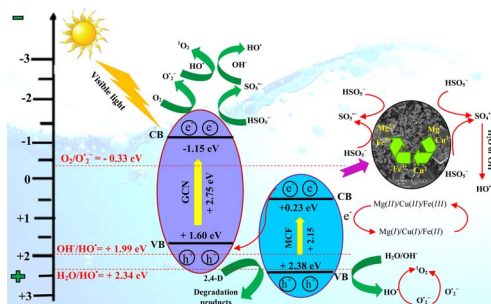
19521



Impact of the rhenium substitution on the oxygen evolution reaction of spinel CoFe₂O₄

Yuruo Zheng, Ghulam Hussain, Changcheng Zheng, Xiaoqi Zhou, Man Zhang, Suirong Xie, Qianhe Yin, Shuyi Li, Batool Shanta and Xiawa Wang*

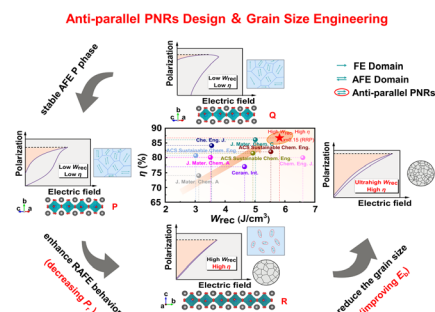
19532



Enhanced peroxymonosulfate-mediated photocatalytic pesticide degradation by a novel stable multi-metal ferrite (Mg, Cu, Fe) anchored on g-C₃N₄

Samaneh Taghilou, Mohammad Reza Mehrasbi, Ali Esrafil, Emad Dehghanifard, Majid Kermani,* Babak Kakavandi* and Stefanos Giannakis

19551



Improved energy storage properties achieved in NaNbO₃-based relaxor antiferroelectric ceramics via anti-parallel polar nanoregion design

Zhentao Wang, Da Li, Wenyuan Liu, Xu Liang, Weichen Zhao, Jinnan Liu, Jiajia Ren, Tao Zhou, Diming Xu, Wenfeng Liu and Di Zhou*

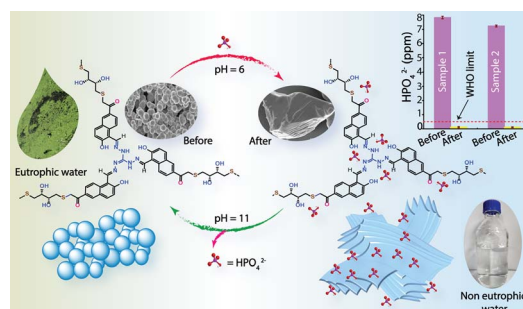


PAPERS

19559

A pH-responsive covalent organic network: morphology change leads to capture and removal of phosphate ions from water

Gunanka Hazarika, Sribash Das, Niku Moni Das and Debasis Manna*



19567

Strong anharmonicity and medium-temperature thermoelectric efficiency in antiperovskite Ca_3XN ($\text{X} = \text{P}, \text{As}, \text{Sb}, \text{Bi}$) compounds

Shuyao Lin, Jincheng Yue, Wenling Ren, Chen Shen* and Hongbin Zhang

