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Journal of Materials Chemistry A

Materials for energy and sustainability

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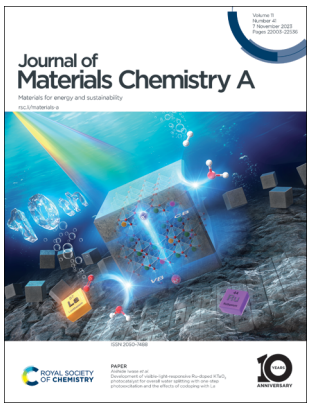

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EDITORIAL

22018

***Journal of Materials Chemistry A* Editor's choice collection: Advancing electrocatalysts for a sustainable world**

Subrata Kundu

REVIEWS

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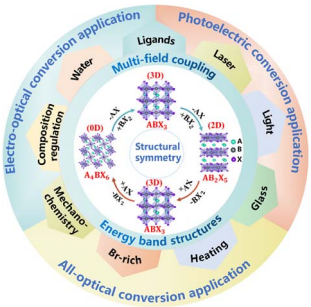
Phase engineering of inorganic halide Cs–Pb–Br perovskites for advanced energy conversion

Zhigang Yang, Shuqin Zhang, Tianqing Sheng, Xinran Lv, Xuguang Wei, Shengjian Qin, Shenghui Yi and Jinjin Zhao*



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REVIEWS

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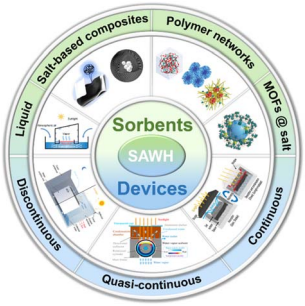
Atmospheric water extraction – a review from materials to devices

Chentian Zhang, Hanyu Guo, Chunmei Li, Fei Wang, Xinyue Guo, Ailin Li, Shanshan Gong, Hongnan Zhang,* Xueping Zhang* and Xiaohong Qin



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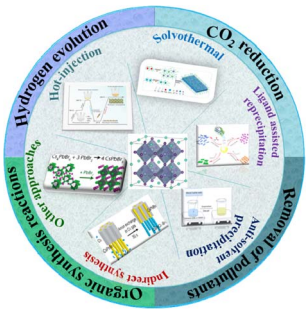
Recent progress in metal halide perovskite-based photocatalysts: physicochemical properties, synthetic strategies, and solar-driven applications

Yanmei Feng, Daimei Chen,* Min Niu, Yi Zhong, Hao Ding, Yingmo Hu, Xiangfeng Wu and Zhongyong Yuan



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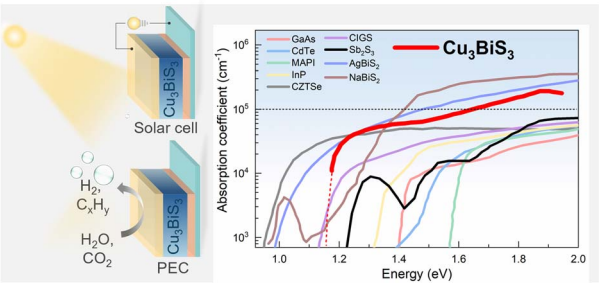
Prospects of copper–bismuth chalcogenide absorbers for photovoltaics and photoelectrocatalysis

Daniely Reis Santos, Sudhanshu Shukla* and Bart Vermang



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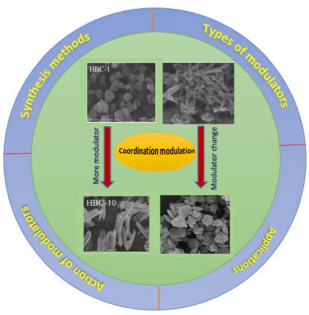
Coordination modulation: a way to improve the properties of metal–organic frameworks

Fahime Bigdeli, Marcus N. A. Fetzer, Berna Nis, Ali Morsali* and Christoph Janiak*



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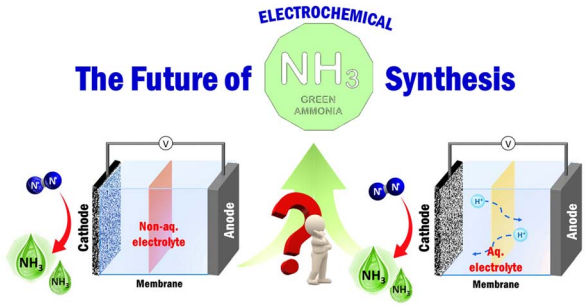

A perspective on the future of electrochemical ammonia synthesis: aqueous or non-aqueous?

Divyani Gupta, Alankar Kafle, Sukhjot Kaur and Tharamani C. Nagaiah*

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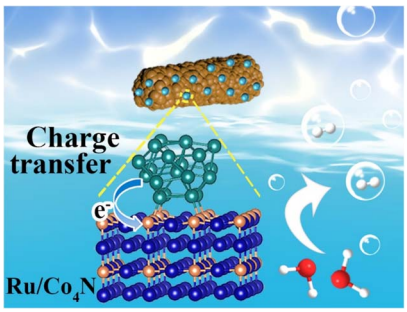

Realization of electron-deficient Ru sites *via* Co_4N coupling for synergistically enhanced alkaline hydrogen evolution

Mengyuan Xing, Xuyun Guo, Wenfang Yuan, Wenxuan Chen, Mengmeng Du, Lejuan Cai,* Valeria Nicolosi, Yang Chai and Bocheng Qiu*

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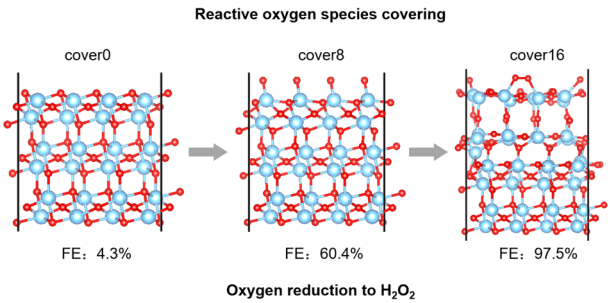

Shifting the O_2 reduction pathway from H_2O to H_2O_2 *via in situ* reconstruction of Ti_2O_3 nanoparticles

Yongchao Yao, Huiqing Wang, Kai Dong, Haobo Li, Jie Liang, Ruizhi Li, Shengjun Sun, Zhengwei Cai, Xun He, Dongdong Zheng, Yonglan Luo, Sulaiman Alfaifi, Dongwei Ma,* Wenchuang (Walter) Hu* and Xuping Sun*

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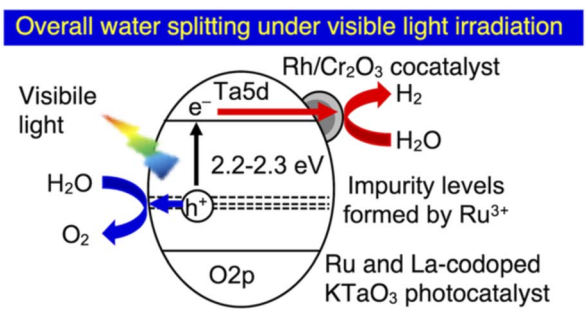

Development of visible-light-responsive Ru-doped $KTaO_3$ photocatalyst for overall water splitting with one-step photoexcitation and the effects of codoping with La

Akihide Iwase,* Miyu Kasahara and Haruka Misono

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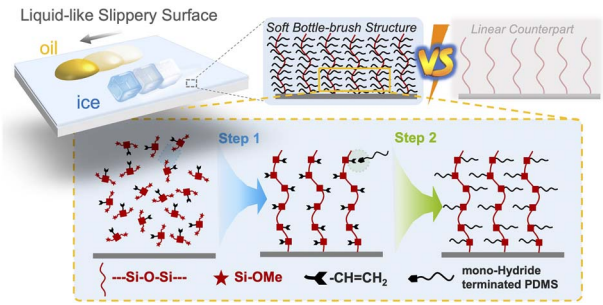
A fluffy all-siloxane bottlebrush architecture for liquid-like slippery surfaces

Yunjiao Gu, He Zhou, Fenghua Liu, Shuxue Zhou* and Weiping Wu*



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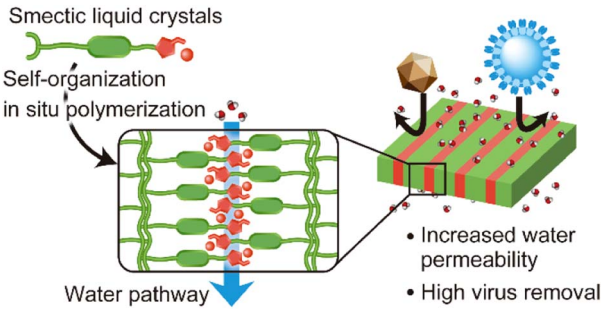
Development of liquid-crystalline smectic nanoporous membranes for the removal of SARS-CoV-2 and waterborne viruses

Takeshi Sakamoto,* Kazuhiro Asakura, Naru Kang, Riki Kato, Miaomiao Liu, Tsuyoshi Hayashi, Hiroyuki Katayama* and Takashi Kato*



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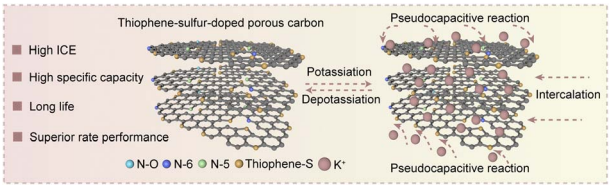
Thiophene-sulfur doping in nitrogen-rich porous carbon enabling high-ICE/rate anode materials for potassium-ion storage

Chuang Qiu, Anuj Kumar, Daping Qiu, Mohammad Tabish, Jiapeng Zhang, Zhijie Jiang, Ang Li, Ghulam Yasin, Xiaohong Chen and Huaihe Song*



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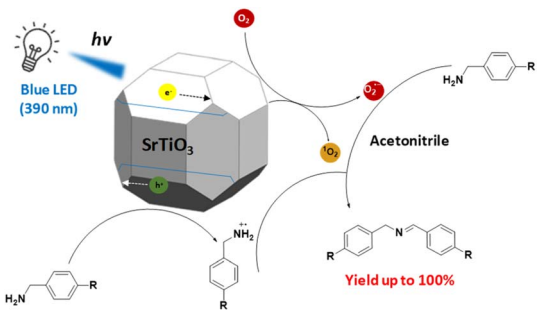
Photocatalytic oxidative amine coupling using polyhedral $SrTiO_3$ crystals

Zong-Li Chen and Michael H. Huang*



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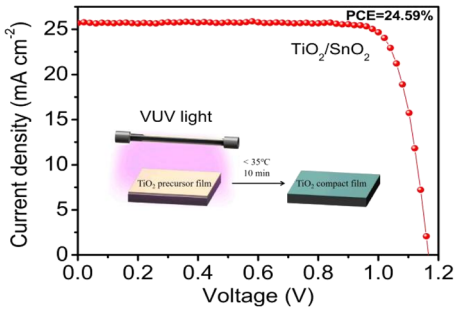

Room-temperature processed TiO_2 to construct composite electron transport layers for efficient planar perovskite solar cells

Jiaduo Wang, Zhuo Dong, Jiajun Wang, Junwei Zhang, Zeyu Zhai, Fazheng Qiu, Jinpeng Wu,* Yuan Lin and Jingbo Zhang*

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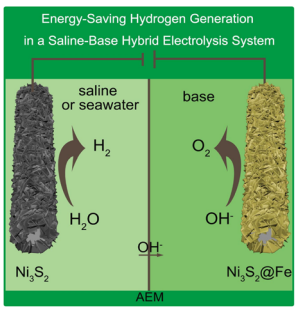

Energy-saving and sustainable saline-base electrolytic hydrogen production system enabled by nickel sulfide-based catalysts

Chengyi Lu, Shuhe Yang, Yunxiang Zhao, Yong Cao, Qiaogao Huang, Wenxin Zhu* and Jianlong Wang*

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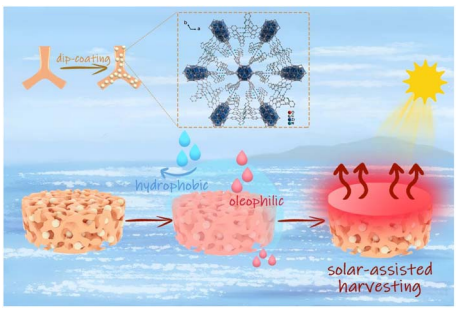

A hydrophobic–superoleophilic 2D Zr-based alkyne-rich metal–organic framework for oil/water separation and solar-assisted oil evaporation

Qian-Ru Luo, Yuan-Hui Zhong, Lai-Hon Chung,* Zhixin Jiang, Qia-Chun Lin, Xin-Ke Xu, Xinhe Ye, Wei-Ming Liao and Jun He*

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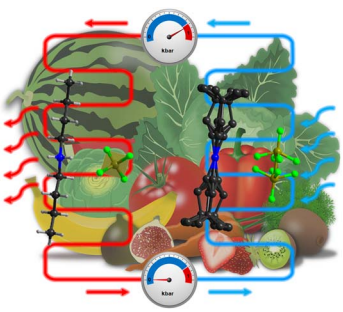

Structure and thermal property relationships in the thermomaterial di-*n*-butylammonium tetrafluoroborate for multipurpose cooling and cold-storage

Javier García-Ben, Juan Manuel Bermúdez-García, Richard J. C. Dixey, Ignacio Delgado-Ferreiro, Antonio Luis Llamas-Saiz, Jorge López-Beceiro, Ramón Artiaga, Alberto García-Fernández, Ute B. Cappel, Bruno Alonso, Socorro Castro-García, Anthony E. Phillips, Manuel Sánchez-Andújar* and María Antonia Señarís-Rodríguez*

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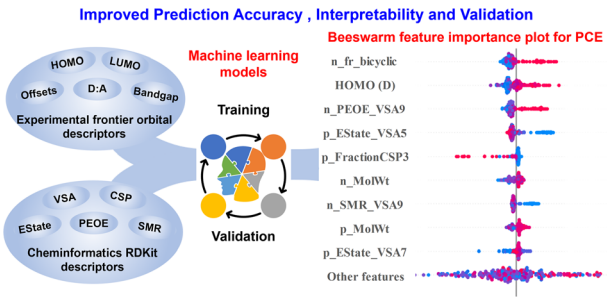
Machine-learning-guided prediction of photovoltaic performance of non-fullerene organic solar cells using novel molecular and structural descriptors

Rakesh Suthar, Abhijith T and Supravat Karak*



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Thiophene-fused boron dipyrromethenes as energy efficient near-infrared photocatalysts for radical polymerizations

Alex Stafford, Seth R. Allen, Tod A. Grusenmeyer, Connor J. O'Dea, Laura Estergreen, Sean T. Roberts* and Zachariah A. Page*

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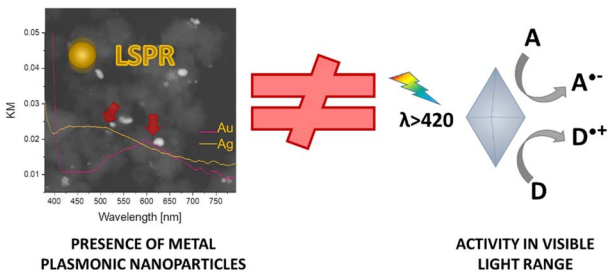
How much is the plasmonic effect worth in photocatalysis? Mechanisms of photocatalytic activity enhancement in composites with metallic nanostructures

Anna Jakimińska and Wojciech Macyk*



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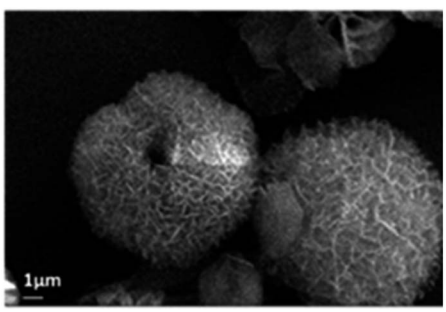
α/β-Ni(OH)$_2$ phase control by F-ion incorporation to optimise hybrid supercapacitor performance

Xuerui Yi, Veronica Celorrio, Haoyu Zhang, Neil Robertson* and Caroline Kirk*



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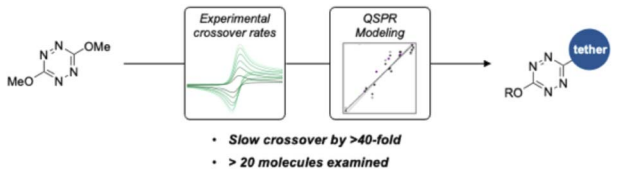

Identifying structure-function relationships to modulate crossover in nonaqueous redox flow batteries

Brianna Jett, Autumn Flynn, Matthew S. Sigman* and Melanie S. Sanford*

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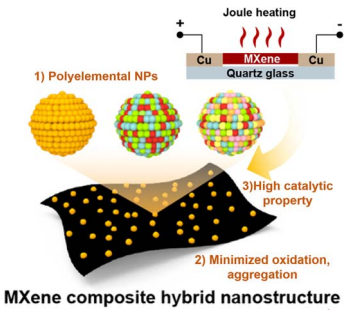
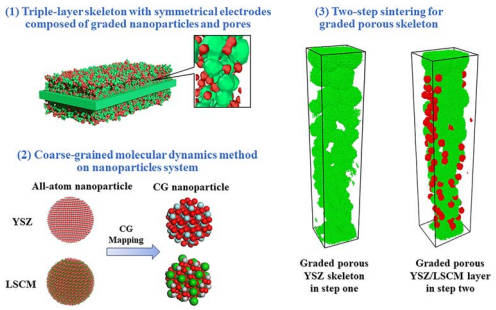


Solution-free synthesis of MXene composite hybrid nanostructures by rapid Joule heating

Jeesoo Yoon, Yong-Jae Kim, Ji-Yoon Song, Aqil Jamal, Issam Gereige, Chansol Kim* and Hee-Tae Jung*

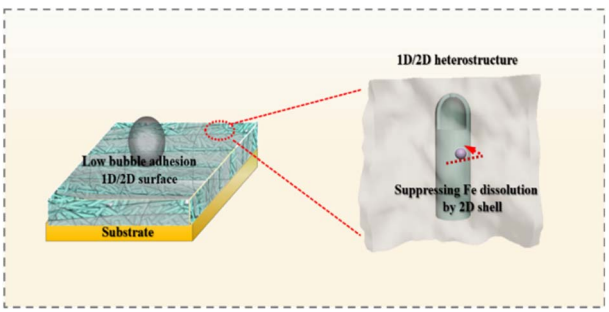
22304



Coarse-grained molecular dynamics modeling and analysis of graded porous electrodes of reversible solid oxide cells sintered in two steps

Chao Yang, Ran Guo, Yu Wu,* Baowei Pan, Jiatang Wang* and Jinliang Yuan*

22320



1D/2D NiFeP/NiFe–OH heterostructure: roles of the unique nanostructure in stabilizing highly efficient oxygen evolution reaction

Fuzhen Zhao, Xin Zheng, Xinyu Mao, Huicong Liu, Liqun Zhu, Weiping Li, Hui Ye* and Haining Chen*

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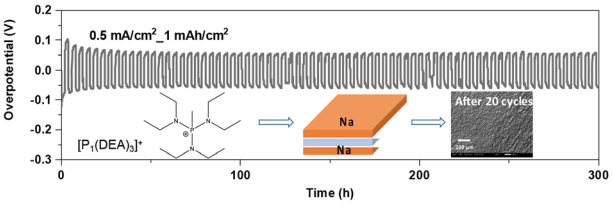
PAPERS

22329

Development of tris(amino)phosphonium electrolytes for high performing sodium batteries

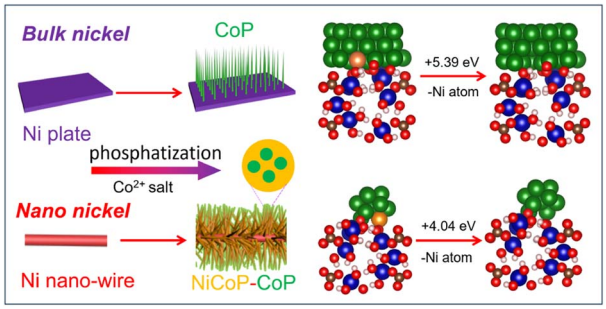
Ju Sun, Colin S. M. Kang, Gongyue Huang, Federico Maria Ferrero Vallana, Ajit Kumar, Luke A. O'Dell, Montserrat Galceran, Oliver Hutt, Patrick C. Howlett, Maria Forsyth* and Jennifer M. Pringle*



22340

Nanosurface-induced construction of NiCoP–CoP heterostructure nanobristle electrodes for highly efficient alkaline hydrogen evolution reaction

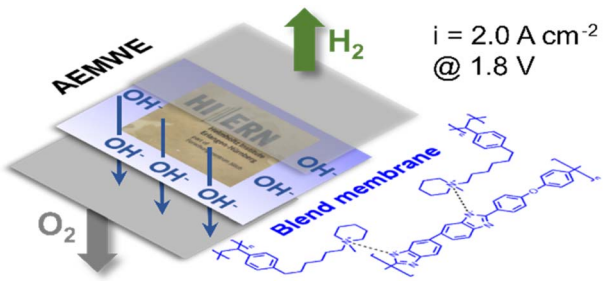
Peng Liu, Juan Wang, Yiming Sui, Guangyao Zhao, Rui Yao, Dongsheng Xia, Zhenbin Guo, Feiyu Kang, Lei Wang* and Cheng Yang*



22347

Novel side chain functionalized polystyrene/O-PBI blends with high alkaline stability for anion exchange membrane water electrolysis (AEMWE)

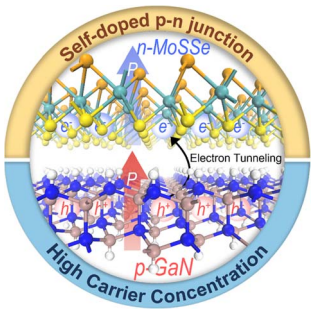
Linus Hager,* Manuel Hegelheimer, Julian Stonawski, Anna T. S. Freiberg, Camilo Jaramillo-Hernández, Gonzalo Abellán, Andreas Hutzler, Thomas Böhm, Simon Thiele and Jochen Kerres*



22360

Self-doped p–n junctions with high carrier concentration in 2D GaN/MoSSe heterostructures: a first-principles study

Dawei Deng, Rutong Si, Bo Wen, Nicola Seriani, Xiao-Lin Wei, Wen-Jin Yin* and Ralph Gebauer*



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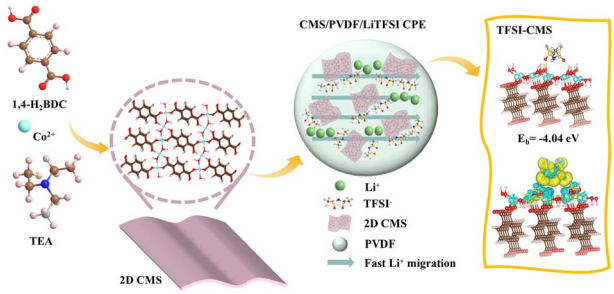
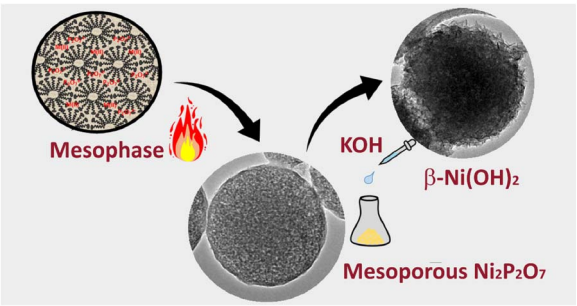
22371



Composite polymer electrolytes incorporating two-dimensional metal–organic frameworks for ultralong cycling in solid-state lithium batteries

Han Jiang, Yongqian Du, Xuanyu Liu, Jiangrong Kong,* Meiqi Huang, Peng Liu and Tao Zhou

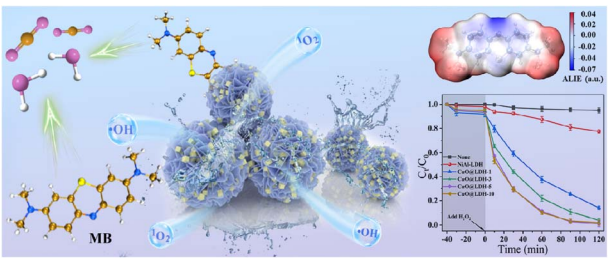
22384



Fabrication of mesoporous nickel pyrophosphate electrodes and their transformation to nickel hydroxide with decent capacitance in alkaline media

Işıl Ulu, Burak Ulgut and Ömer Dag*

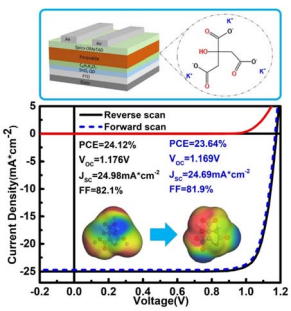
22396



3D flower-like CuO@NiAl-LDH microspheres with enhanced removal affinity to organic dyes: mechanistic insights, DFT calculations and toxicity assessment

Yao Chen, Honglin Lian, Hao Wang, Jun Qin, Xiaolang Chen* and Zongcheng Lu

22409



Synergic interface passivation with potassium citrate as an eco-friendly conductive adhesive in perovskite solar cells

Rui Wu, Lan Xiao, Ziyi Wang, Chang Shi, Shuping Xiao, Wuchen Xiang, Zhongli Qin,* Xiangbai Chen, Guojia Fang and Pingli Qin*

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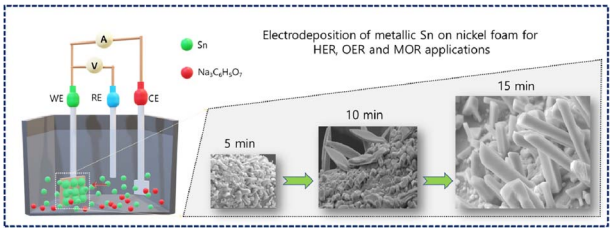
PAPERS

22419

Methanol-assisted energy-saving green hydrogen production using electrodeposited 3D-metallic tin as an electrocatalyst

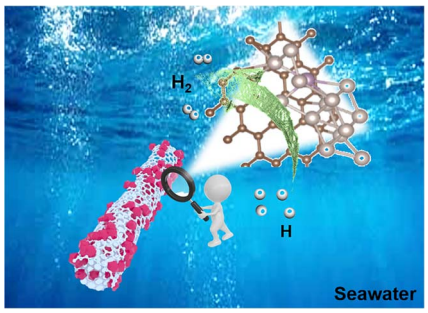
Aparna Sajeev, Karthikeyan Krishnamoorthy, Parthiban Pazhamalai, Kousik Bhunia, Arunprasath Sathyaseelan and Sang-Jae Kim*



22430

Ultrafast carbothermal shocking fabrication of cation vacancy-rich Mo doped Ru nanoparticles on carbon nanotubes for high-performance water/seawater electrolysis

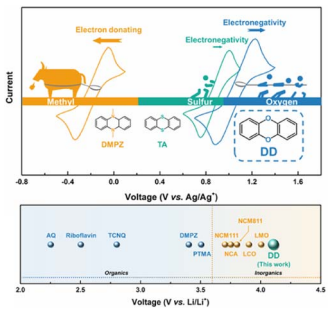
Jianpeng Sun, Zhan Zhao, Zizhen Li, Zisheng Zhang, Rufan Zhang* and Xiangchao Meng*



22441

High-voltage (4.1 V) organic electrode material with an oxygen redox center

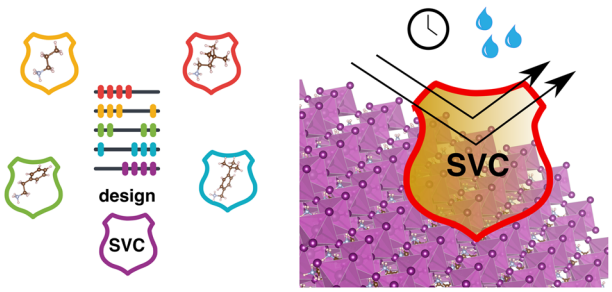
Sechan Lee, Giyun Kwon, Taewon Kang, Jihyeon Kim, Byungju Lee, Chunjoong Kim, Changsoo Lee, Youngsu Kim, Joohyeon Noh, Young-Sang Yu,* Dongwhan Lee* and Kisuk Kang*



22449

Supramolecular virtual crystal: a fast and accurate guideline for molecular passivation of perovskite materials

Juan Camilo Alvarez-Quiceno,* Jorge Mario Osorio-Guillén and Pascal Pochet



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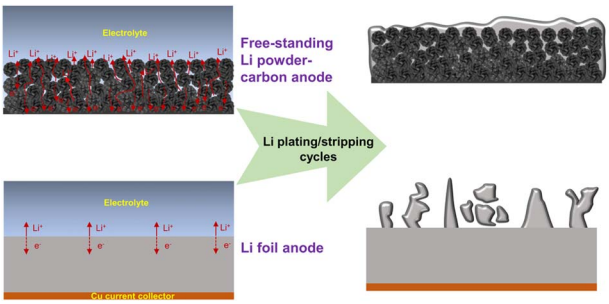
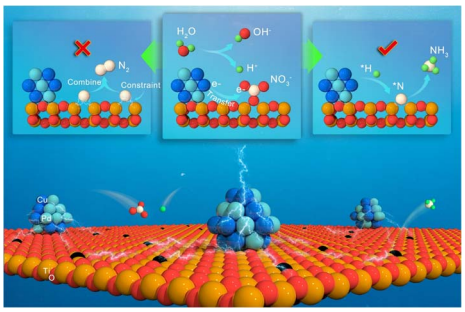
22456



Uniform distribution of metallic lithium and carbon on the nanoscale for highly stable carbon-based lithium metal anodes

Zipeng Jiang, Haiyan Liu, Tao Liu, Chenyang Meng, Zhijie Jiang, Mohammad Tabish, Xiaoqi Yu, Ang Li, Xiaohong Chen and Huaihe Song*

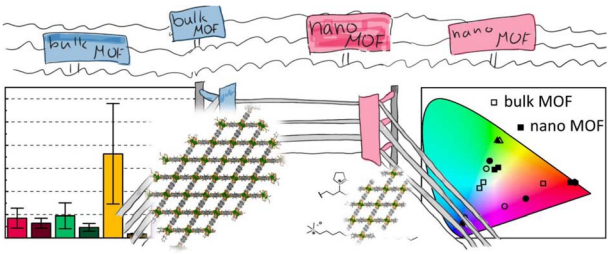
22466



Enhanced localized electron density from PdCu nanoparticle loading on a defective TiO_2 support for selective nitrate electroreduction to ammonia

Haoran Wu, Heng Guo,* Fengying Zhang, Peng Yang, Jiaxin Liu, Yuantao Yang, Zhen-Feng Huang, Chenyuan Zhu, Weitao Wang, Xin Tu,* Guidong Yang and Ying Zhou*

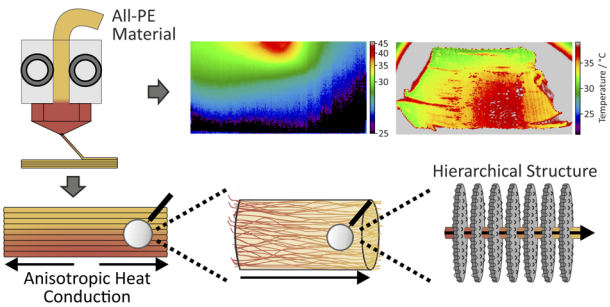
22478



Nano *vs.* bulk: surfactant-controlled photophysical and morphological features of luminescent lanthanide MOFs

Moritz Maxeiner, Lea Wittig, Alexander E. Sedykh, Thomas Kasper and Klaus Müller-Buschbaum*

22492



High and tuneable anisotropic thermal conductivity controls the temperature distribution of 3D printed all-polyethylene objects

Ina Klein, Thomas Tran, René Reiser, Maximilian Theis, Sabine Rosenfeldt, Marius Schöttle, Carl Schirmeister, Peter Bösecke, Stefan Rettinger, Rolf Mülhaupt and Markus Retsch*

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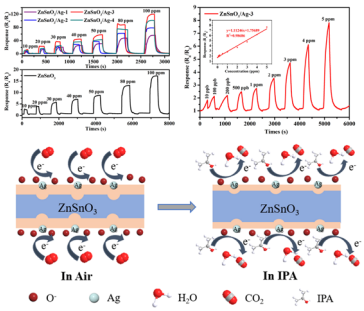
PAPERS

22503

ppb-Level detection of isopropanol based on porous $ZnSnO_3$/Ag through the synergistic effects of Ag and amorphous nanocube structures

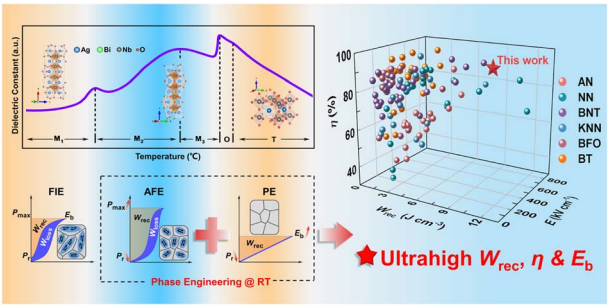
Fangling Zhou, Zhuangzhuang Mu, Zhenyu Yuan,* Hongmin Zhu, Xin Yan,* Hongliang Gao and Fanli Meng*



22512

Superior energy storage performance realized in antiferroelectric 0.10 wt% MnO_2–$AgNbO_3$ ceramics *via* Bi-doping induced phase engineering

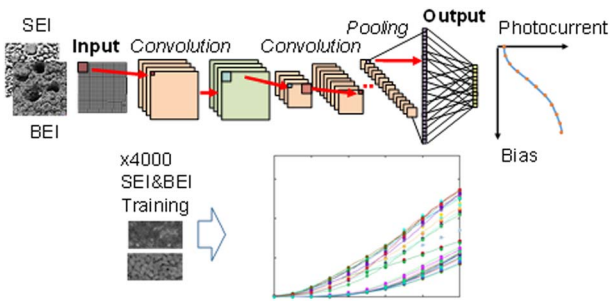
Jing Wang, Xuhui Fan, Zhen Liu, Kongjun Zhu, Hao Yuan, Zehan Zheng, Lei Zhao,* Ji Zhang,* Qibin Yuan* and Jing-Feng Li*



22522

Convolutional neural network prediction of the photocurrent–voltage curve directly from scanning electron microscopy images

Yuta Hayashi, Yuya Nagai, Zhenhua Pan and Kenji Katayama*



CORRECTION

22533

Correction: An organic/inorganic coating strategy that greatly enhanced sensing performances and reliability of all-fabric piezoresistive sensors

Guangliang Tian, Kangli Xu, Yaoli Huang, Xinxin You, Wenhua Yu, Honggang Liu, Juan Li, Jiawei Liu, Xiangyu Jin, Haoxuan Li,* Qinfei Ke* and Chen Huang*