

Journal of Materials Chemistry A

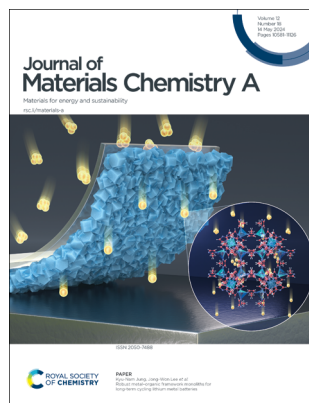
Materials for energy and sustainability

rsc.li/materials-a

The Royal Society of Chemistry is the world's leading chemistry community. Through our high impact journals and publications we connect the world with the chemical sciences and invest the profits back into the chemistry community.

IN THIS ISSUE

ISSN 2050-7488 CODEN JMCAET 12(18) 10581–11126 (2024)



Cover

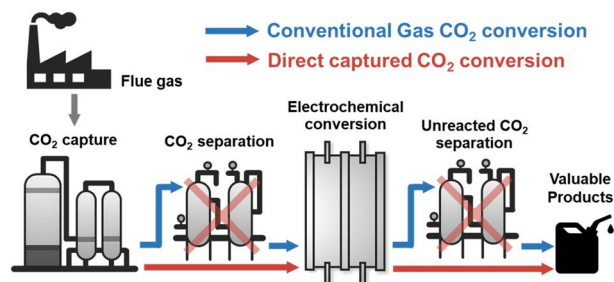
See Kyu-Nam Jung, Jong-Won Lee *et al.*, pp. 10686–10694. Image reproduced by permission of Jong-Won Lee from *J. Mater. Chem. A*, 2024, 12, 10686.

REVIEWS

10597

Advances in the direct electro-conversion of captured CO₂ into valuable products

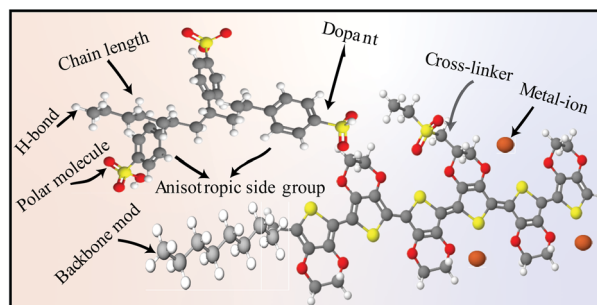
Kezia Langie, Gwangsu Bak, Ung Lee, Dong Ki Lee, Chan Woo Lee, Yun Jeong Hwang* and Da Hye Won*



10614

Molecular perspective and engineering of thermal transport and thermoelectricity in polymers

Sai C. Yelishala, Connor Murphy and Longji Cui*



RSC Sustainability

GOLD
OPEN
ACCESS

Dedicated to sustainable
chemistry and new solutions

For an open, green and inclusive future

rsc.li/RSCSus

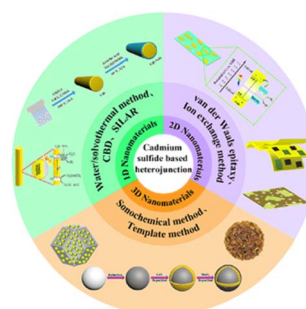
Fundamental questions
Elemental answers

REVIEWS

10659

Recent advances in CdS heterojunctions: morphology, synthesis, performances and prospects

Wenchao Wang, Jing Xue* and Jixian Liu*

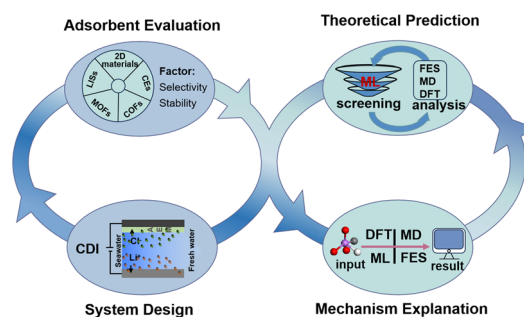


PERSPECTIVE

10676

Insights into adsorbent materials for lithium extraction by capacitive deionization: reconceptualizing the role of materials informatics

Liang Bai, Ruibo Xu, Wenjie Wu,* Chenchen Ma, Sheng Li, Huimin Gao, Dan Luo, Botong Liu, Saad Melhi, Yadong Zhao, Zhong Liu,* Yusuke Yamauchi* and Xingtao Xu*

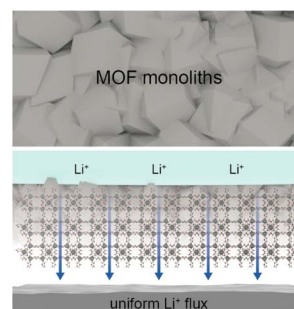


PAPERS

10686

Robust metal–organic framework monoliths for long-term cycling lithium metal batteries

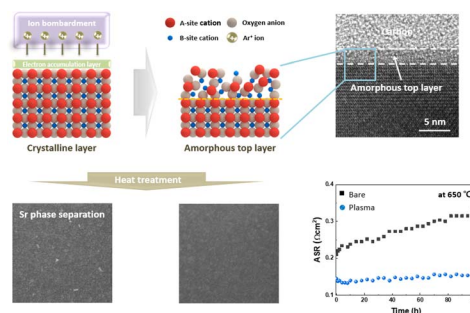
Chaejeong Kim, Wooyoung Jeong, Hong Rim Shin, Kyu-Nam Jung* and Jong-Won Lee*



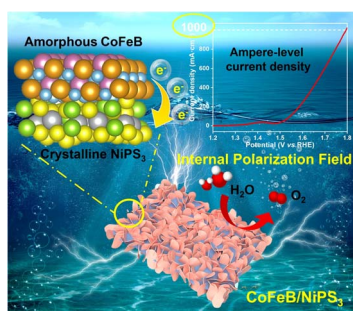
10695

Enhanced catalytic activity and stability of SOFC electrodes through plasma-driven surface modification

Hyunduck Shin, Jongsu Seo, SungHyun Jeon, Seung Jin Jeong, Jinwook Kim, Siwon Lee, Jeong Jin Lee and WooChul Jung*



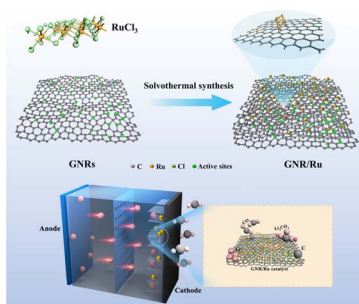
10704



Amorphous–crystalline CoFeB/NiPS₃ vertical heterostructure with a built-in electric field for robust amperic-level water oxidation

Sijia Zhao, Yaoda Liu,^{*} Ya Chen, Lei Li, Wenfang Zhai, Zhixin Guo and Zhengfei Dai^{*}

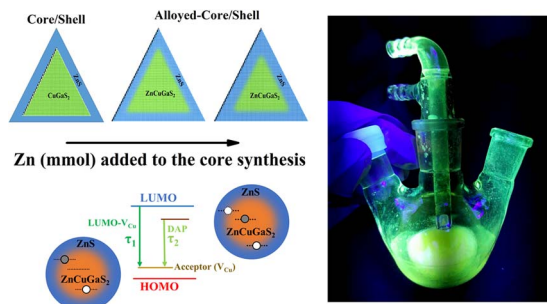
10713



Graphene nanoribbons/Ru as efficient cathodic catalysts for high-performance rechargeable Li–CO₂ batteries

Xiaoling Ye, Wencheng Liu, Yan Lu, Xiaoxiao Zheng, Yijian Bi, Min Zheng, Lei Han, Benqing Liu, Yafei Ning, Syed Hassan Mujtaba Jafri, Xinyu Zhao,^{*} Shangming He,^{*} Shilin Zhang^{*} and Hu Li^{*}

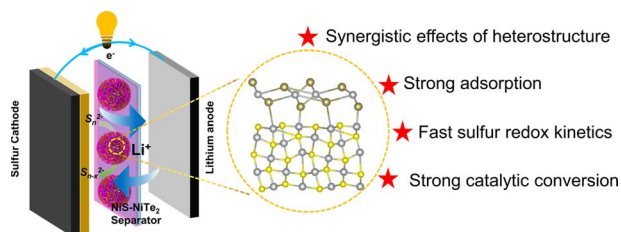
10726



Zn alloying strategy to improve the photoluminescence of CuGaS₂/ZnS core/shell quantum dots

Mohammed Abdul Haque, Amruta Lohar, Yogesh Jadhav, Ravi Kumar, S. N. Jha, D. Bhattacharyya, Sandesh Jadhkar, Shrikrishna Sartale and Shailaja Mahamuni^{*}

10737



Promoting overall sulfur redox kinetics for Li–S batteries via interfacial synergy in a NiS–NiTe₂ heterostructure-modified separator

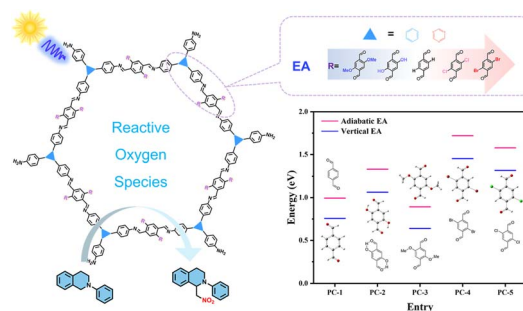
Jie Xie, Feng Cheng, Ruoyu Chen,^{*} Zhong Jin^{*} and Lin Sun^{*}



10745

Functional group substitution strongly influences the performances of covalent organic frameworks in the photocatalytic metal-free oxidase reaction

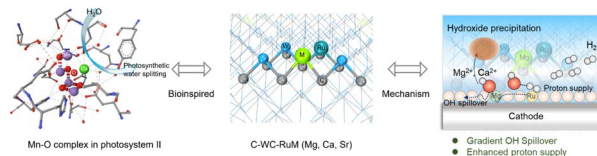
Huiying Chen, Qinghai Zhou, Jinyang Hai, Mingxiang Zhu* and Fang Zhang*



10755

Alkaline-earth-metal regulated metal carbides with bioinspired gradient OH spillover for efficient and long-lasting direct seawater electrolysis

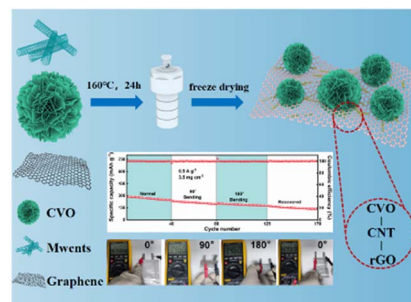
Huijuan Wu, Zhenyang Zhao, Mao Wang,*
Weiqiong Zheng, Yiming Zhang, Yinghan Wang, Tian Ma,
Zhiyuan Zeng, Chong Cheng* and Shuang Li*



10764

Foldable chromium vanadate cathodes for high-performance aqueous zinc ion batteries

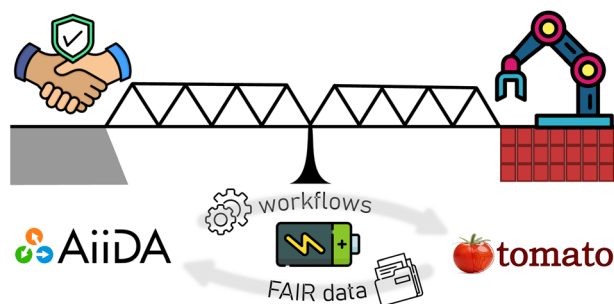
Peiqi Shi, Meng Huang, Lianmeng Cui, Bomian Zhang,
Lei Zhang, Qinyou An* and Liqiang Mai*



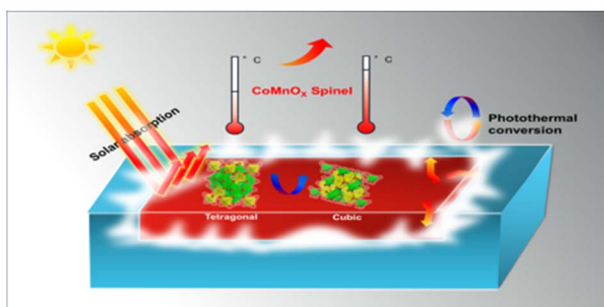
10773

A bridge between trust and control: computational workflows meet automated battery cycling

Peter Kraus, Edan Bainglass, Francisco F. Ramirez,
Enea Svaluto-Ferro, Loris Ercole, Benjamin Kunz,
Sebastian P. Huber, Nukorn Plainpan, Nicola Marzari,
Corsin Battaglia* and Giovanni Pizzi*



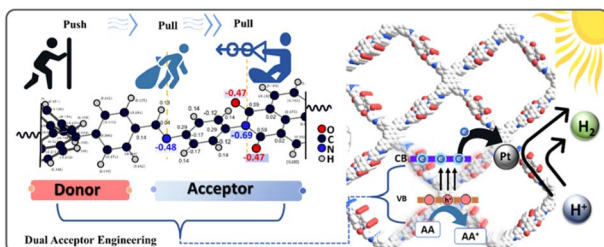
10784



Crystal phase-dependent optical properties of CoMn-based spinel oxides for solar thermal conversion

Huilan Ma, Shengyang Wang, Qi Ye, Longfei Guo, Entao Wang, Jun Li and Can Li*

10790

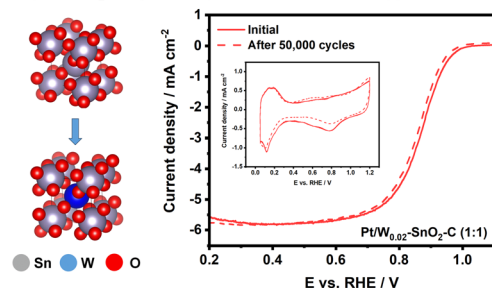


Push–pull–pull interactions of 2D imide–imine-based covalent organic framework to promote charge separation in photocatalytic hydrogen production

Islam M. A. Mekhemer, Mohamed M. Elsenety, Ahmed M. Elewa, Khanh Do Gia Huynh, Maha Mohamed Samy, Mohamed Gamal Mohamed, Dalia M. Dorrah, Dung Chau Kim Hoang, Ahmed Fouad Musa, Shiao-Wei Kuo and Ho-Hsiu Chou*

10799

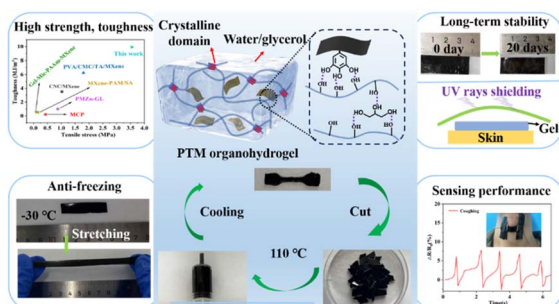
W doped SnO₂ – High stability and water retention support for ORR catalyst



Significantly improved stability and water retention for Pt supported on W-doped SnO₂ to catalyse the oxygen reduction reaction in proton exchange membrane fuel cells

Wei Cao, Yiyang Mao, Bin Hu, Yongqing Yang, Wei Zhou* and Zongping Shao*

10808



High-strength, ultra-tough and recyclable MXene-composited organohydrogels with integrated multiple functions for wearable sensors

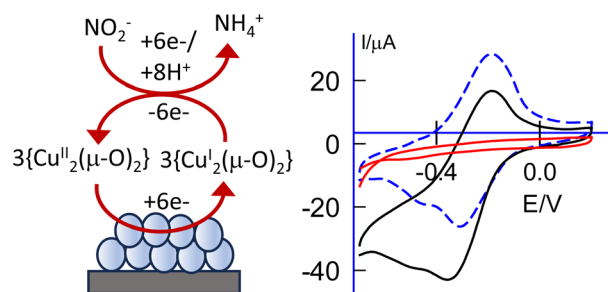
Zhihui Qin,* Yunfeng Li, Xiaoming Wang, Ying Liu, Na Li, Qiuli Xu, Lei Ye and Tifeng Jiao*



10819

A (μ -oxo) dicopper complex anchoring graphitized mesoporous carbon surface prepared by an *in situ* electrochemical method for bioinspired electrocatalytic reduction of nitrite to ammonia and sensing

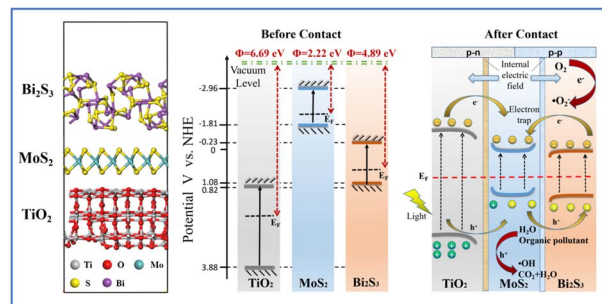
Sairaman Saikrithika, Natarajan Saravanan, M. Gabriela Almeida and Annamalai Senthil Kumar*



10838

Improving built-in electric fields for effective photocatalytic activity in the rationally designed electron transfer pathway of $\text{TiO}_2@ \text{MoS}_2 / \text{Bi}_2\text{S}_3$

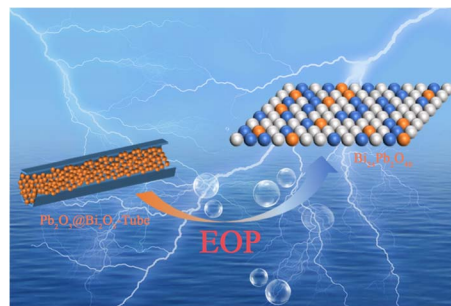
Jiangu Gong,* Yihang Zhang, Ting Yue and Yao Lu



10852

Regulation of the microenvironment of $\text{Pb}_2\text{O}_3@ \text{Bi}_2\text{O}_3$ -tube by structural reconstruction for boosting the electrochemical ozone production performance

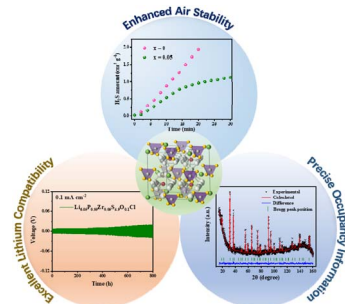
Huaijie Shi, Xiaosa Wang, Xiaoge Peng, Mingzhe Xue, Yufeng Xue, Fengying Gao, Xing Zhong* and Jianguo Wang*



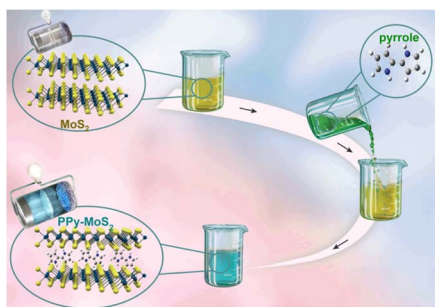
10863

Li-argyrodite solid-state electrolytes with lithium compatibility and air stability for all-solid-state batteries

Daoxi Wang, Haiting Shi, Wenhui Cui, Hao Li, Jiarong Niu, Shuo Wang and Zhiwei Xu*



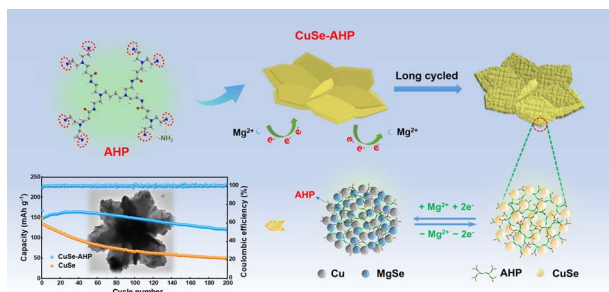
10875



Enhancing the performance and cyclability of MoS₂ cathodes with interspace layer engineering using polypyrrole

Nima Mikaeili Chahartagh, Ali Molaei Aghdam,^{*} Shahriar Namvar and Mehryar Jafari

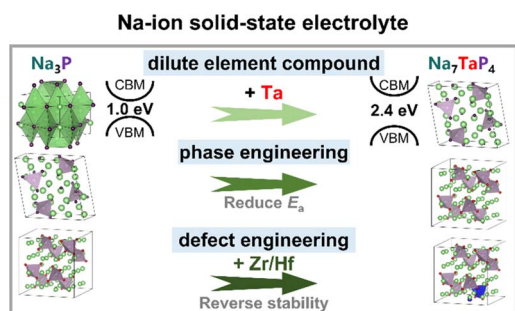
10888



Copper selenide/amino hyperbranched polymer as an organic/inorganic hybrid composite cathode for rechargeable magnesium batteries

Lin Ran, Hao Li, Fei Xu, Daohong Zhang^{*} and Ting Li^{*}

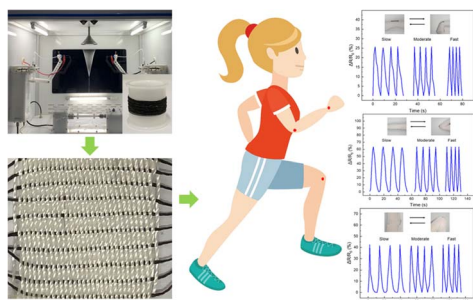
10897



A hierarchical approach to designing a Na-rich phosphide solid-state electrolyte for Na-ion batteries

Aming Lin, Jing Shi, Su-Huai Wei^{*} and Yi-Yang Sun^{*}

10905



Highly stretchable GR/TPU strain sensor based on one-step electrospun fibrous yarns for wearable devices

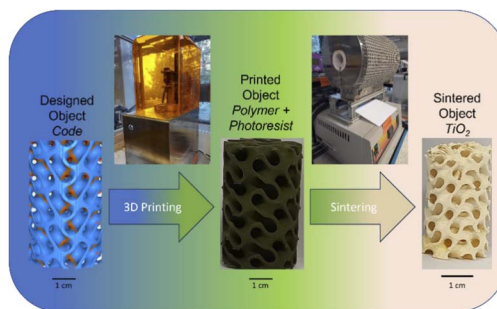
Lei Xing, Linze Li, Yu Liu, Junyi Ren, Guilei Guo, Yifan Chen, Yu Zheng^{*} and Bin Sun^{*}



10913

Mixed-phase titania foams via 3D-printing for pharmaceutical degradation

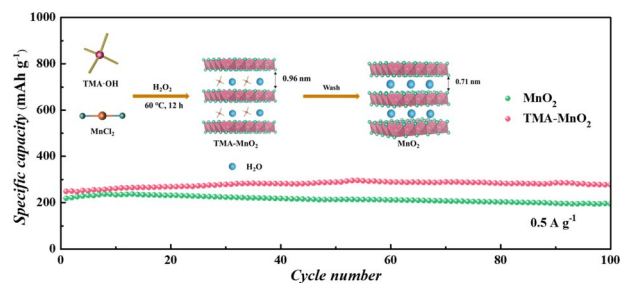
Zachary Warren, Thais Tasso Guaraldo, Ivan Barisic, Garyfalia A. Zoumpouli, Jannis Wenk and Davide Mattia*



10923

Ultra-low diffusion barrier tetramethyl ammonium cation-intercalated layered MnO₂ for high-performance aqueous zinc-ion batteries

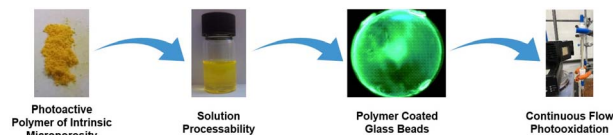
Zixiang Zhou, Jianbo Tong,* Xiaoliang Zou, Yue Wang, Yuxuan Bai, Yifan Yang, Youyong Li, Chao Wang* and Shuling Liu*



10932

Immobilisation of benzo[*c*][1,2,5]thiadiazole (BTZ) within polymers of intrinsic microporosity (PIMs) for use in flow photochemistry

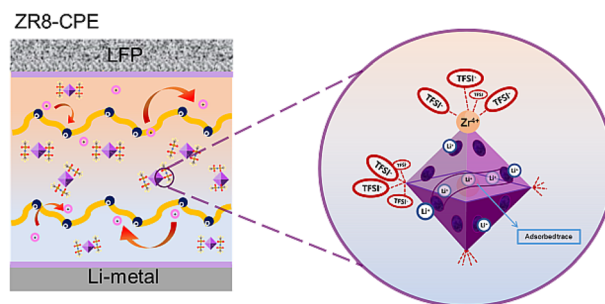
Dominic Taylor, John M. Tobin, Leonardo Amicosante, Andrew W. Prentice, Martin J. Paterson, Scott J. Dalgarno,* Neil B. McKeown* and Filipe Vilela*



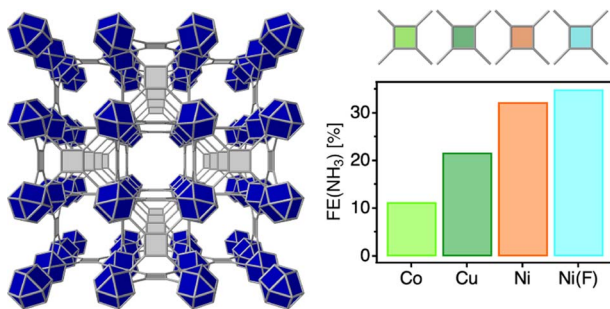
10942

Achieving high durability in all-solid-state lithium metal batteries using metal-organic framework solid polymer electrolytes

Suin Kim, Hasan Jamal, Firoz Khan, Amir Al-Ahmed, Mahmoud M. Abdelnaby, Atif Al-Zahrani, Sang-Eun Chun* and Jae Hyun Kim*



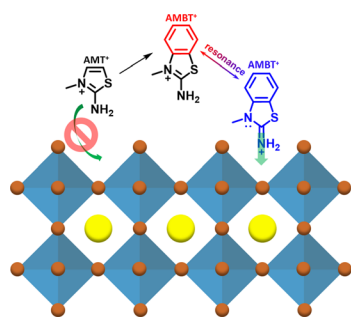
10956



Tailoring the efficiency of porphyrin molecular frameworks for the electroactivation of molecular N_2

María Romero-Angel, Roumayssa Amrine, Beatriz Ávila-Bolívar, Neyvis Almora-Barrios, Carolina R. Ganivet, Natalia M. Padial, Vicente Montiel, José Solla-Gullón,* Sergio Tatay* and Carlos Martí-Gastaldo*

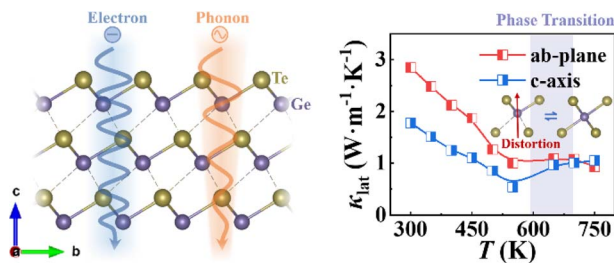
10965



A resonance spacer cation-based heterostructure enables efficient and stable perovskite solar cells

Zijian Deng, Xichuan Yang,* Qingning Hou, Miao Jiang, Huhu Liang, Shukang Li, Mengde Zhai, Haoxin Wang, Ming Cheng,* Li Zhang and Licheng Sun

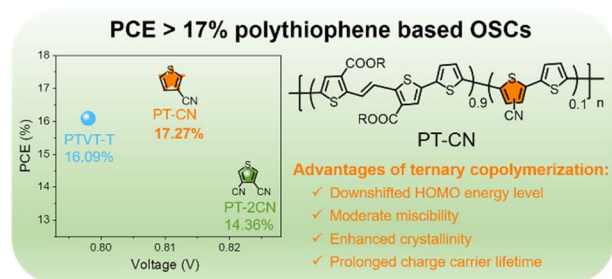
10974



Anisotropic thermoelectric properties of GeTe single crystals

Hanbing Chen, Qingfeng Song,* Ziming Zhang, Shun Wan, Lidong Chen and Shengqiang Bai*

10984



Ternary polythiophene enables over 17% efficiency organic solar cells

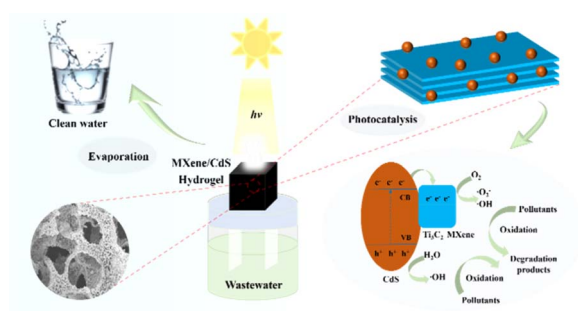
Qi Ai, Zhihui Lin, Xiangxi Wu, Yufan Zhu, Ke Wang, Xiaojun Li, Jianqi Zhang, Dan He, Yongfang Li and Fuwen Zhao*



10991

MXene/CdS photothermal–photocatalytic hydrogels for efficient solar water evaporation and synergistic degradation of VOC

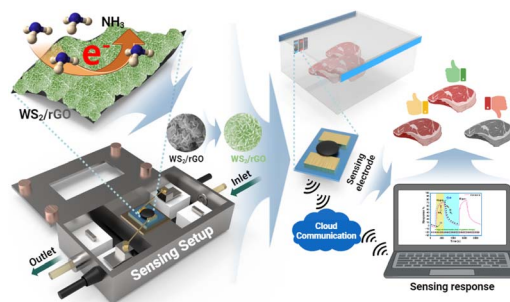
Zhen-Yu Wang, Lei Xu, Cai-Hua Liu, Sheng-Jie Han, Ming-Lai Fu* and Baoling Yuan*



11004

Live-tracking of beef freshness by sub-ppb level ammonia detection using WS₂/rGO nanoflakes incorporating edge site-enriched acidic sulfur

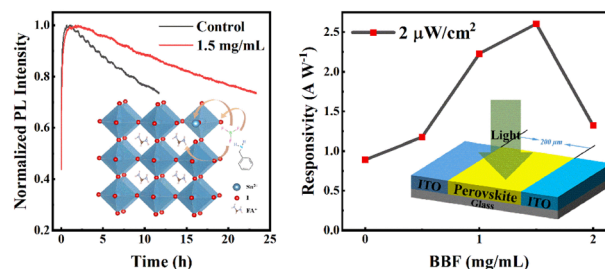
Sonam Sonwal, Kugalur Shanmugam Ranjith, Soobin Han, Young-Kyu Han,* Mi-Hwa Oh* and Yun Suk Huh*



11020

Photoelectric performance enhancement of Sn-based perovskites by benzylamine boron trifluoride passivation

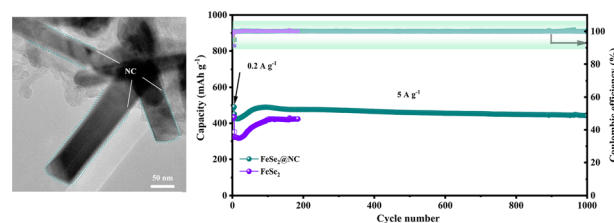
Wenhao Zheng, Xiao Peng, Wenjing Zhai, Lin Huang, Peizhuo Chen, Penghui Shi, Xiaohui Zhou, Jianguo Wan, Zhibo Yan* and J.-M. Liu



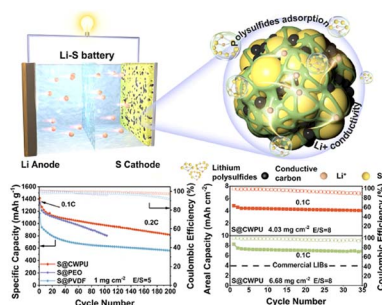
11028

FeSe₂ micro-nanorods confined in N-doped carbon as an advanced anode for fast sodium ion storage

Shilin Zhou, Rui Jiang, Shige Wang, Lu Yu, Xiaoyan Shi, Lianyi Shao,* Zhipeng Sun* and Lifeng Hang*



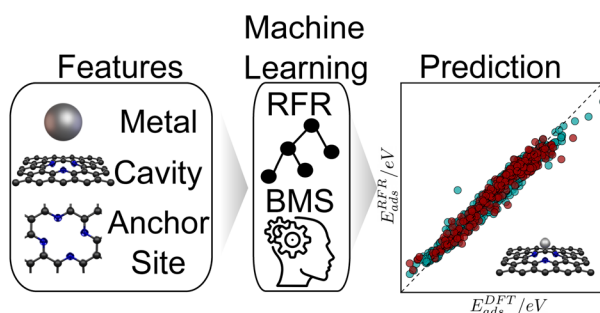
11038



An interweaving 3D ion-conductive network binder for high-loading and lean-electrolyte lithium–sulfur batteries

Jing Chen, Xin Geng, Chenyang Wang, Xu Hou, Hailong Wang, Qinlang Rong, Nuo Sun, Wei Liu, Linyu Hu, Xiaowei Fu, Jingxin Lei, Zhimeng Liu* and Xin He*

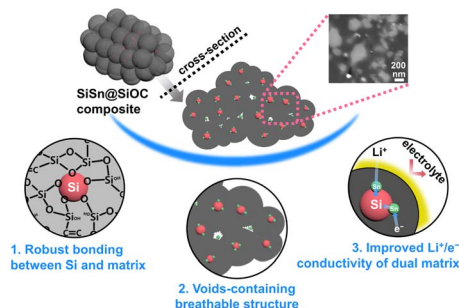
11049



A generalized model for estimating adsorption energies of single atoms on doped carbon materials

Maria G. Minotaki, Julian Geiger, Andrea Ruiz-Ferrando, Albert Sabadell-Rendón* and Núria López*

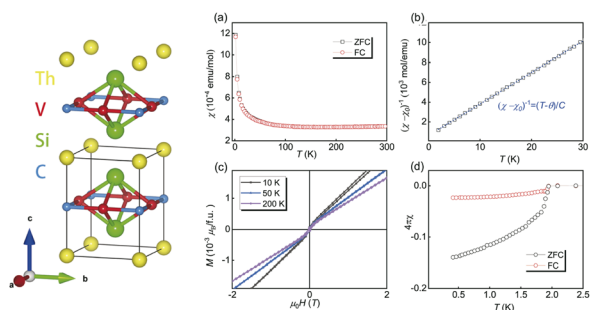
11062



Covalent-assisted seeding of Si nanoparticles into a dual-matrix design toward advanced Si-based Li-ion batteries

Kwanghyun Do, Changyong Park, Jeonguk Hwang, Sucheol Kim, Yeju Jung, Se Hun Lee, Hee-Dae Lim* and Heejoon Ahn*

11075



Synthesis, crystal structure and physical properties of ThV₂Si₂C containing V₂C square lattices

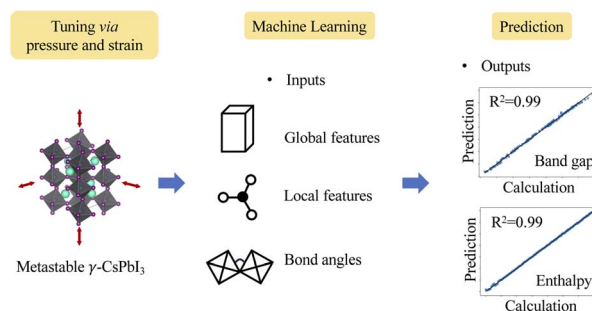
Yusen Xiao, Yongliang Chen,* Yong Li, Zhiwei Wen, Yajing Cui, Tao Jia, Shulong Li, Baizhuo Li, Kaixin Wu, Qingchen Duan, Hao Ni, Shaohua Liu, Cao Wang and Yong Zhao*



11082

Machine learning-empowered study of metastable γ -CsPbI₃ under pressure and strain

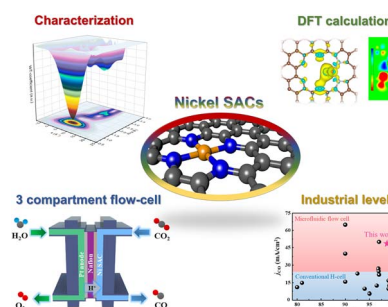
Minkyung Han,* Cheng Peng, Ruyi Song, Feng Ke, Youssef S. G. Nashed, Wendy L. Mao, Chunjing Jia* and Yu Lin*



11090

A MOF-derived pyrrolic N-stabilized Ni single atom catalyst for selective electrochemical reduction of CO₂ to CO at high current density

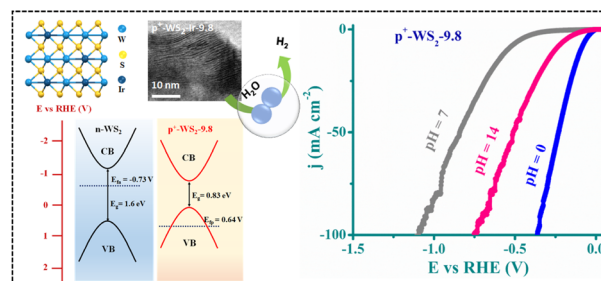
Jin Wook Lim, Dong Heon Choo, Jin Hyuk Cho, Jaehyun Kim, Won Seok Cho, Odongo Francis Ngome Okello, Kisoo Kim, Sungwon Lee, Junwoo Son, Si-Young Choi, Jong Kyu Kim, Ho Won Jang,* Soo Young Kim* and Jong-Lam Lee*



11101

Efficient hydrogen evolution from degenerate-doped p-type WS₂ electrocatalysts over a wide pH range

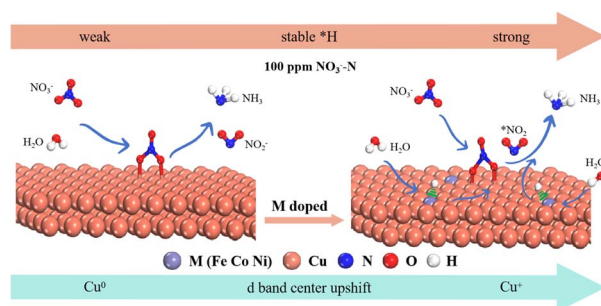
Pamula Siva and Kuraganti Vasu*



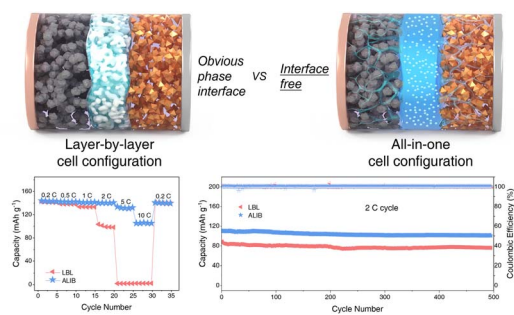
11109

Structure identification and mechanism exploration of ultralow-content of metal doped Cu for efficient electrochemical production of ammonia in dilute nitrate concentrations

Jiayu Zhan, Lu-Hua Zhang, Yaohua Hong and Fengshou Yu*



11115



A new paradigm for battery structural design towards interface-free, all-in-one cell configuration

Weixing Xiong, Xueying Zheng, Yuchen Li, Zhang Cao, Jiayang Sun, Yan Wang, Linze Lv, Qunting Qu, Wei Luo* and Honghe Zheng*

