

Materials Horizons

rsc.li/materials-horizons

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 2051-6347 CODEN MHAOAL 11(11) 2531-2762 (2024)



Cover

See Hu Zhang et al.,
pp. 2603–2614.
Image reproduced
by permission of
Hu Zhang from
Mater. Horiz.,
2024, 11, 2603.

EDITORIAL

2539

Materials Horizons Emerging Investigator Series:
Professor Jingjing Duan, Nanjing University of
Science and Technology, China

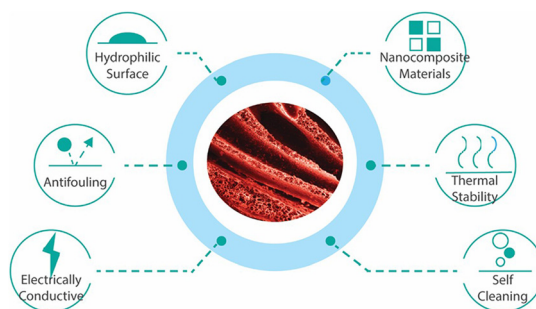


COMMENTARY

2540

A reflection on 'Highly dispersible polypyrrole nanospheres for advanced nanocomposite ultrafiltration membranes'

Cheng-Wei Lin and Richard B. Kaner*



EES Catalysis

GOLD
OPEN
ACCESS

**Exceptional research on energy
and environmental catalysis**

Open to everyone. Impactful for all

rsc.li/EESCatalysis

**Fundamental questions
Elemental answers**

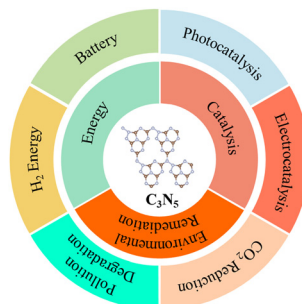


REVIEWS

2545

C₃N₅-based nanomaterials and their applications in heterogeneous catalysts, energy harvesting, and environmental remediation

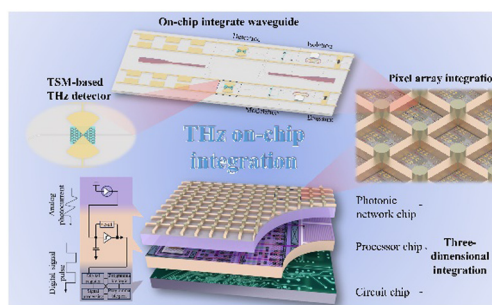
Linfeng Xiao, Sanshuang Gao, Runhua Liao,*
Yingtang Zhou,* Qingquan Kong and Guangzhi Hu*



2572

Two-dimensional topological semimetals: an emerging candidate for terahertz detectors and on-chip integration

Yun Li, Wenzhi Yu, Kai Zhang, Nan Cui, Tinghe Yun,
Xue Xia, Yan Jiang, Guangyu Zhang, Haoran Mu* and
Shenghuang Lin*

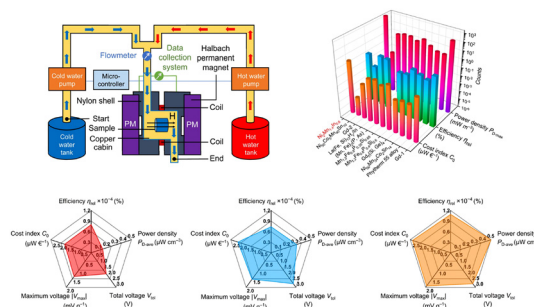


COMMUNICATIONS

2603

Excellent thermomagnetic power generation for harvesting waste heat via a second-order ferromagnetic transition

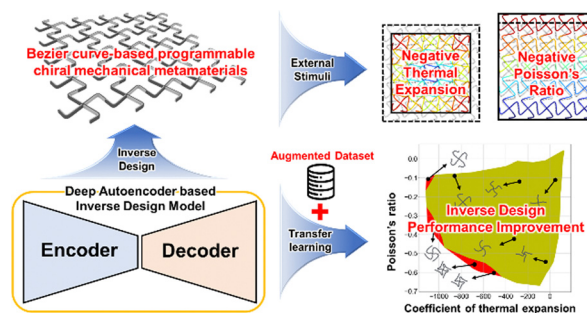
Haodong Chen, Xianliang Liu, Yao Liu, Longlong Xie,
Ziyuan Yu, Kaiming Qiao, Mingze Liu, Fengxia Hu,
Baogen Shen, R. V. Ramanujan, Ke Chu and Hu Zhang*



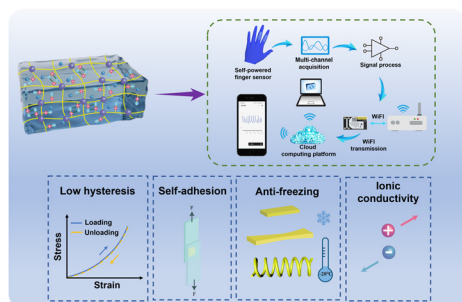
2615

Inverse design of Bézier curve-based mechanical metamaterials with programmable negative thermal expansion and negative Poisson's ratio via a data augmented deep autoencoder

Min Woo Cho, Keon Ko, Majid Mohammadhosseinzadeh,
Ji Hoon Kim, Dong Yong Park, Da Seul Shin* and
Sang Min Park*



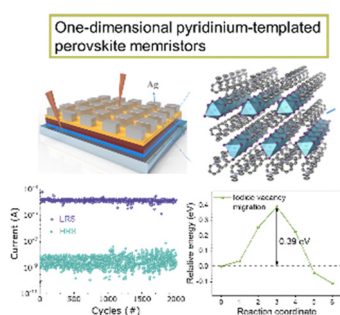
2628



Low hysteresis zwitterionic supramolecular polymer ion-conductive elastomers with anti-freezing properties, high stretchability, and self-adhesion for flexible electronic devices

Hongying Wang, Baocheng Liu, Danyang Chen, Zhuoya Wang, Haolun Wang, Siyu Bao, Ping Zhang,* Jianhai Yang* and Wenguang Liu

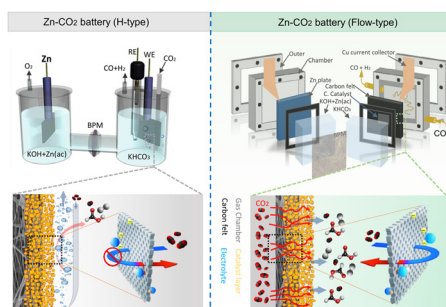
2643



High-performance one-dimensional halide perovskite crossbar memristors and synapses for neuromorphic computing

Sujaya Kumar Vishwanath,* Benny Febriansyah, Si En Ng, Tisita Das, Jyotibdha Acharya, Rohit Abraham John, Divyam Sharma, Putu Andhita Dananjaya, Metikoti Jagadeeswararao, Naveen Tiwari, Mohit Ramesh Chandra Kulkarni, Wen Siang Lew, Sudip Chakraborty,* Arindam Basu and Nripan Mathews*

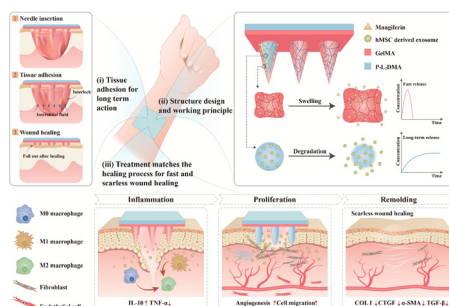
2657



Unlock flow-type reversible aqueous Zn–CO₂ batteries

Muhammad Kashif Aslam, Herui Wang, Zhihao Nie, Sheng Chen, Qiang Li* and Jingjing Duan*

2667



A differential-targeting core-shell microneedle patch with coordinated and prolonged release of mangiferin and MSC-derived exosomes for scarless skin regeneration

Shang Lyu, Qi Liu, Ho-Yin Yuen, Huizhi Xie, Yuhe Yang, Kelvin Wai-Kwok Yeung, Chak-yin Tang, Shuqi Wang, Yaxiong Liu, Bin Li,* Yong He* and Xin Zhao*

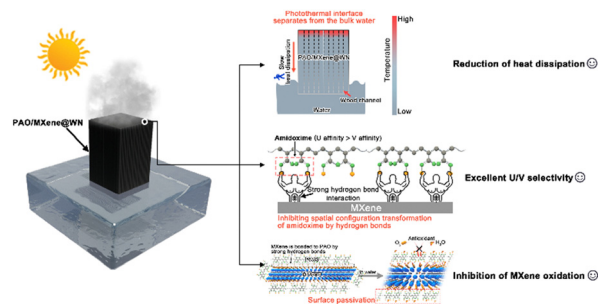


COMMUNICATIONS

2685

Achieving ultrahigh uranium/vanadium selectivity of poly(amidoxime) via coupling MXene-enabled strong intermolecular interaction and separated photothermal interface

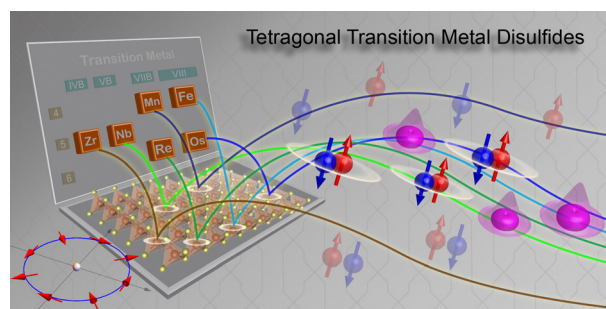
Hao Ye, Ming-Bang Wu,* Qi-Hui Ye, Rou-Ming Wen, Zhang-Ting Hu, Juming Yao* and Chao Zhang*



2694

Prediction of superconductivity in a series of tetragonal transition metal dichalcogenides

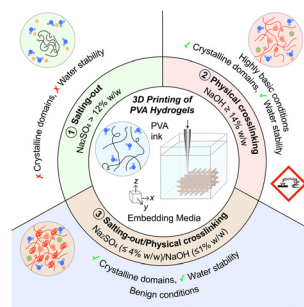
Jiale Liu, Huidong Wang, Xiaojun Shi and Xiaoming Zhang*



2701

3D printing of polyvinyl alcohol hydrogels enabled by aqueous two-phase system

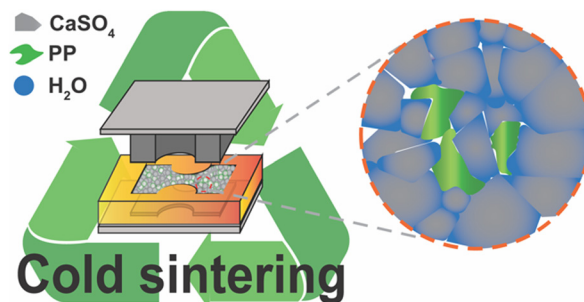
Rahul Karyappa, Nidhi Nagaraju, Kento Yamagishi, Xue Qi Koh, Qiang Zhu and Michinao Hashimoto*



2718

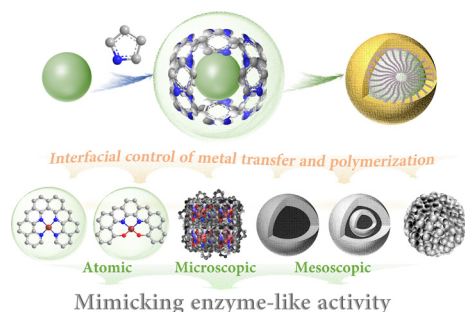
Upcycling plastic waste into fully recyclable composites through cold sintering

Po-Hao Lai, Shelby L. Hall, Yi-Chen Lan, Jia-Ruey Ai, Arian Jaberi, Amir Sheikhi, Rui Shi, Bryan D. Vogt* and Enrique D. Gomez*



COMMUNICATIONS

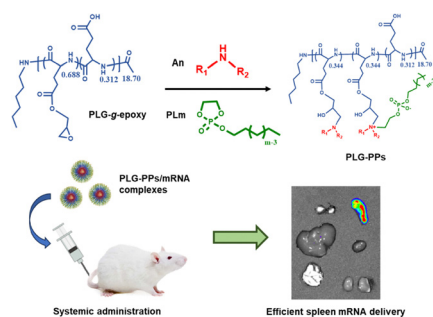
2729



Linking atomic to mesoscopic scales in multilevel structural tailoring of single-atom catalysts for peroxide activation

Li Yu,* Shaosong Xin, Yuchan Li and Hsien-Yi Hsu

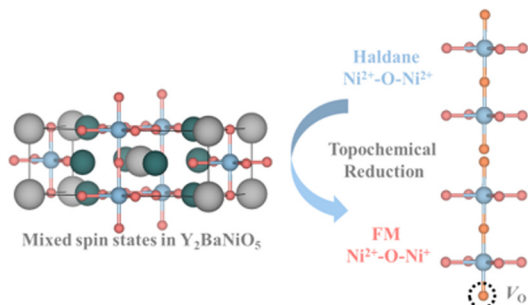
2739



A polyamino acid-based phosphatidyl polymer library for *in vivo* mRNA delivery with spleen targeting ability

Hanqin Zhao, Sheng Ma, Yibo Qi, Yuxi Gao, Yuyan Zhang, Minhui Li, Jie Chen, Wantong Song* and Xuesi Chen*

2749



Spin-degree manipulation for one-dimensional room-temperature ferromagnetism in a haldane system

Pengfei Tan, Chuanhui Zhu, Xiaosheng Ni, Han-Qing Wu, Shuang Zhao, Tao Xia, Jinjin Yang, Tao Han, Mei-Huan Zhao, Yifeng Han, Yuanhua Xia, Zheng Deng, Muwei Wu, Dao-Xin Yao* and Man-Rong Li*

CORRECTION

2759

Correction: A differential-targeting core-shell microneedle patch with coordinated and prolonged release of mangiferin and MSC-derived exosomes for scarless skin regeneration

Shang Lyu, Qi Liu, Ho-Yin Yuen, Huizhi Xie, Yuhe Yang, Kelvin Wai-Kwok Yeung, Chak-yin Tang, Shuqi Wang, Yaxiong Liu, Bin Li,* Yong He* and Xin Zhao*

