

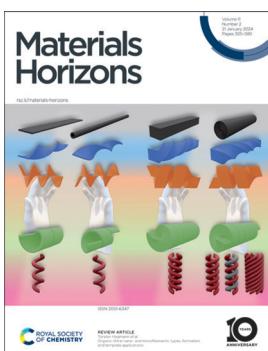
Materials Horizons

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.

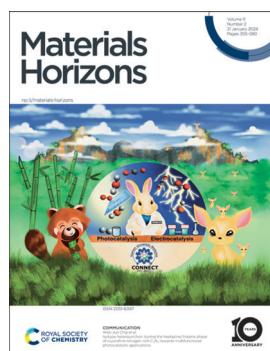
IN THIS ISSUE

ISSN 2051-6347 CODEN MHAOAL 11(2) 305–580 (2024)



Cover

See Torsten Hegmann et al., pp. 316–340.
Image reproduced by permission of Grace A. R. Rohaley and Torsten Hegmann from *Mater. Horiz.*, 2024, 11, 316.



Inside cover

See Wee-Jun Ong et al., pp. 408–418.
Image reproduced by permission of Wee-Jun Ong from *Mater. Horiz.*, 2024, 11, 408.

EDITORIAL

314

Materials Horizons Emerging Investigator Series:
Professor Dr Wee-Jun Ong, Center of Excellence for NaNo Energy & Catalysis Technology (CONNECT), Xiamen University, Malaysia



REVIEWS

316

Organic chiral nano- and microfilaments: types, formation, and template applications

Ashwathanarayana Gowda, Suraj Kumar Pathak, Grace A. R. Rohaley, Gourab Acharjee, Andrea Oprandi, Ryan Williams, Marianne E. Prévôt and Torsten Hegmann*





NEW
JOURNAL

RSC Applied Interfaces

GOLD
OPEN
ACCESS

Interfacial and surface research with an applied focus

Interdisciplinary and open access



rsc.li/RSCApplInter

Fundamental questions
Elemental answers

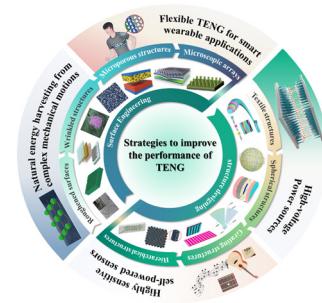
Registered charity number: 207890

REVIEWS

341

Boosting the output performance of triboelectric nanogenerators *via* surface engineering and structure designing

Lingang Wu, Pan Xue, Shize Fang, Meng Gao, Xiaojie Yan, Hong Jiang, Yang Liu,* Huihui Wang,* Hongbin Liu and Bowen Cheng*



363

Advancements and applications of upconversion nanoparticles in wound dressings

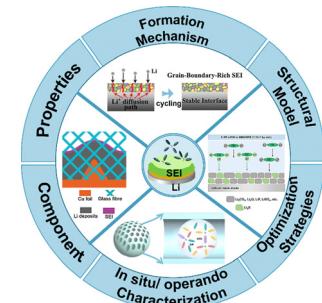
Hazal Ezgi Gültkin, Gökçen Yaşayan, Ayça Bal-Öztürk, Ashkan Bigham, Abdolreza (Arash) Simchi, Atefeh Zarepour, Siavash Iravani* and Ali Zarrabi*



388

Recent progress in SEI engineering for boosting Li metal anodes

Yue Wu, Ce Wang, Chengjie Wang, Yan Zhang, Jingbing Liu, Yuhong Jin,* Hao Wang* and Qianqian Zhang*

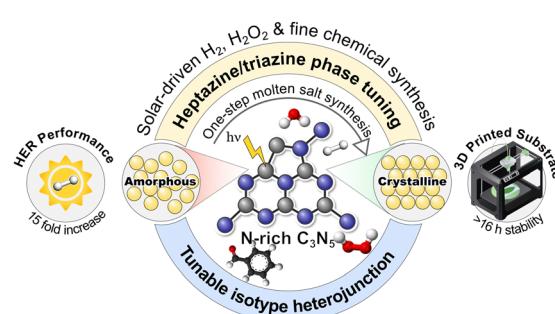


COMMUNICATIONS

408

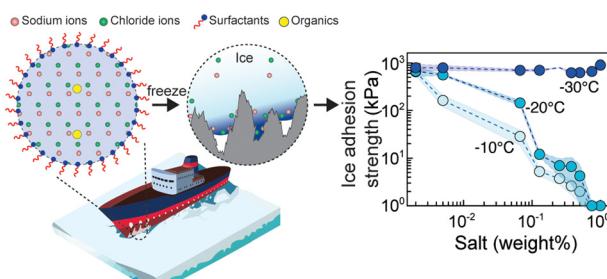
Isotype heterojunction: tuning the heptazine/triazine phase of crystalline nitrogen-rich C₃N₅ towards multifunctional photocatalytic applications

Sue-Faye Ng, Joel Jie Foo and Wee-Jun Ong*



COMMUNICATIONS

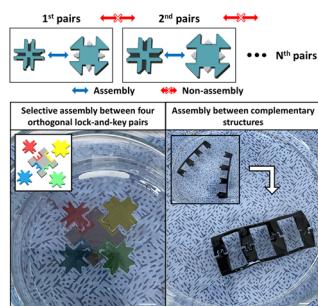
419



Adhesion of impure ice on surfaces

Rukmava Chatterjee, Rajith Unnikrishnan Thanjukutty, Christopher Carducci, Arnab Neogi, Suman Chakraborty, Vijay Prithiv Bathey Ramesh Bapu, Suvo Banik, Subramanian K. R. S. Sankaranarayanan and Sushant Anand*

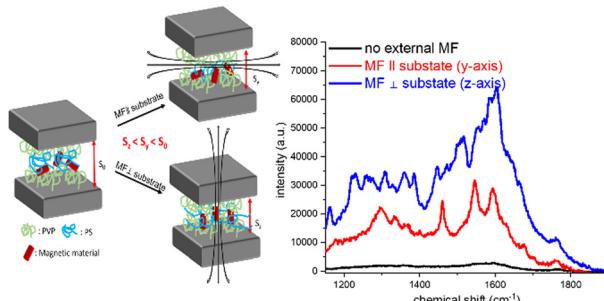
428



Precise and selective macroscopic assembly of a dual lock-and-key structured hydrogel

Eunseok Heo, Wooseop Hwang, Hye Been Koo, Steve Park, Do-Nyun Kim, Ho-Young Kim, YongJoo Kim and Jae-Byum Chang*

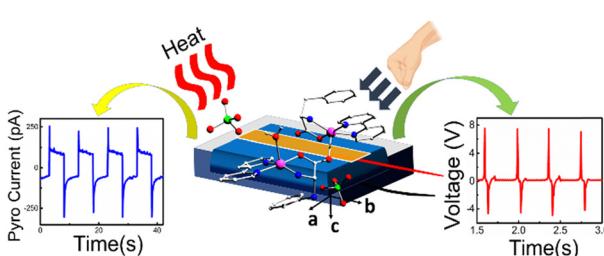
442



Metal dimer nanojunction-magnetic material composites for magnetic field sensing

Gang-Yi Chen, Fang-Chih Liu and Su-Wen Hsu*

454



Deciphering the anisotropic energy harvesting responses of an above room temperature molecular ferroelectric copper(II) complex single crystal

Rajashi Haldar, Ajay Kumar, Dipankar Mandal* and Maheswaran Shanmugam*

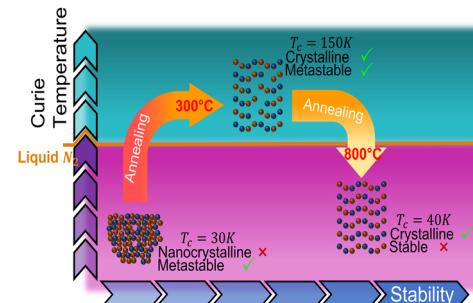


COMMUNICATIONS

460

Kinetics vs. thermodynamics: walking on the line for a five-fold increase in MnSi Curie temperature

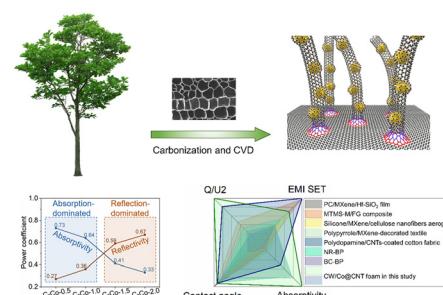
Adrián Benedit-Cárdenas,* Stéphanie Bruyère, Sylvie Migot, Thomas Hauet, Sébastien Petit-Watelot, Pascal Boulet, Dominique Muller, Dmitry A. Zuev, David Horwat and Alexandre Nominé*



468

Enhanced polarization via Joule heating in wood-derived carbon materials for absorption-dominated EMI shielding

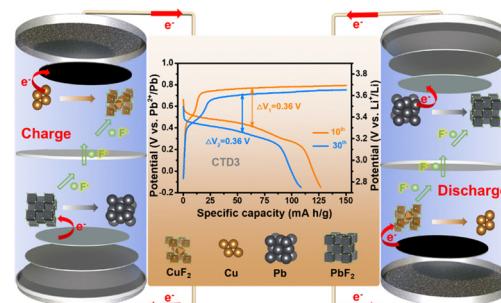
Haoyang Feng, Jianming Hong, Jiaxiang Zhang, Pingping He, Honghai Zhou, Sai Wang,* Hongna Xing and Ruosong Li*



480

Room-temperature reversible F-ion batteries based on sulfone electrolytes with a mild anion acceptor additive

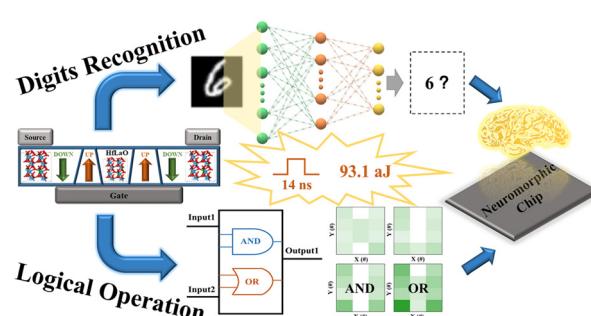
Yifan Yu, Meng Lei and Chilin Li*



490

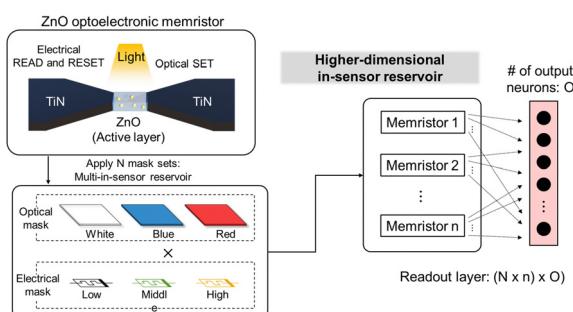
Low-power and high-speed HfLaO-based FE-TFTs for artificial synapse and reconfigurable logic applications

Yongkai Liu, Tianyu Wang,* Kangli Xu, Zhenhai Li, Jiajie Yu, Jialin Meng, Hao Zhu, Qingqing Sun, David Wei Zhang and Lin Chen*



COMMUNICATIONS

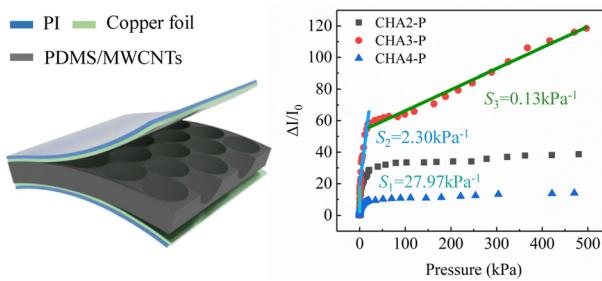
499



A high-dimensional in-sensor reservoir computing system with optoelectronic memristors for high-performance neuromorphic machine vision

Yoon Ho Jang, Joon-Kyu Han, Sangik Moon, Sung Keun Shim, Janguk Han, Sunwoo Cheong, Soo Hyung Lee and Cheol Seong Hwang*

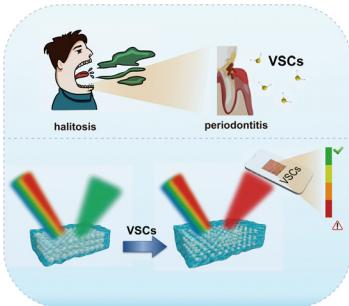
510



A cross-scale honeycomb architecture-based flexible piezoresistive sensor for multiscale pressure perception and fine-grained identification

Chenxi Lu, Yuan Gao, Xiaobao Chan, Wei Yu, Haifeng Wang, Liang Hu and Lingwei Li*

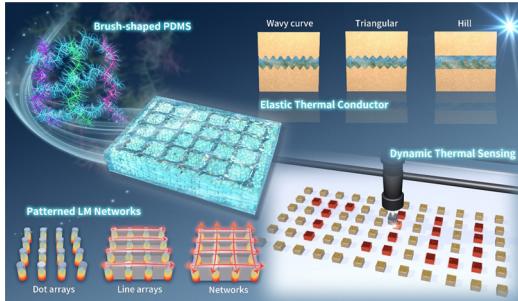
519



A structural color hydrogel for diagnosis of halitosis and screening of periodontitis

Chuanshun Hu, Jieyu Zhou, Jin Zhang, Yonghang Zhao, Chunyu Xie, Wei Yin, Jing Xie, Huiying Li, Xin Xu, Lei Zhao, Meng Qin* and Jianshu Li*

531



Patterned liquid metal embedded in brush-shaped polymers for dynamic thermal management

Qingxia He, Mengmeng Qin*, Heng Zhang, Junwei Yue, Lianqiang Peng, Gejun Liu, Yiyu Feng and Wei Feng*

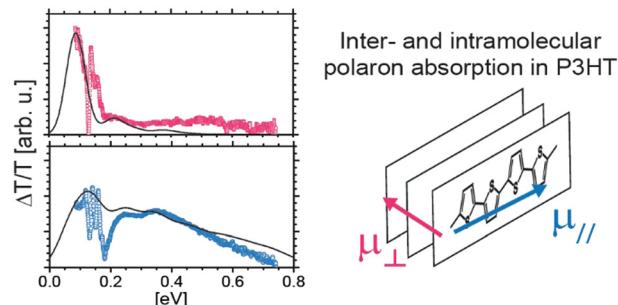


COMMUNICATIONS

545

Polaron absorption in aligned conjugated polymer films: breakdown of adiabatic treatments and going beyond the conventional mid-gap state model

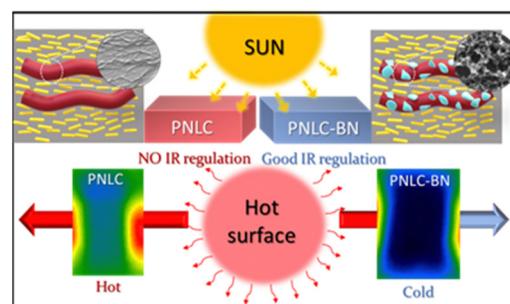
Garrett LeCroy, Raja Ghosh, Viktoriya Untilova, Lorenzo Guio, Kevin H. Stone, Martin Brinkmann, Christine Luscombe, Frank C. Spano* and Alberto Salleo*



554

IR regulation through preferential placement of h-BN nanosheets in a polymer network liquid crystal

Gayathri R. Pisharody, Priyabrata Sahoo, D. S. Shankar Rao, H. S. S. Ramakrishna Matte, Debabrata Sikdar and S. Krishna Prasad*



566

3D nitrogen-doped carbon frameworks with hierarchical pores and graphitic carbon channels for high-performance hybrid energy storages

Jae Won Choi, Dong Gyu Park, Keon-Han Kim, Won Ho Choi, Min Gyu Park and Jeung Ku Kang*

