

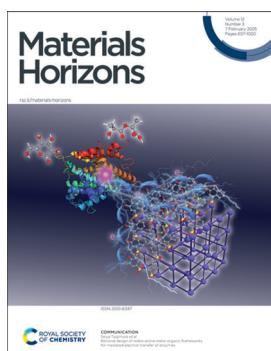
Materials Horizons

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.

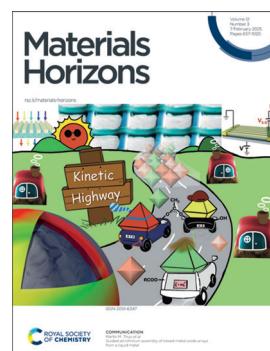
IN THIS ISSUE

ISSN 2051-6347 CODEN MHAOAL 12(3) 657–1020 (2025)



Cover

See Seiya Tsujimura *et al.*, pp. 760–769.
Image reproduced by permission of Seiya Tsujimura, Muhammad Rezki from *Mater. Horiz.*, 2025, 12, 760.



Inside cover

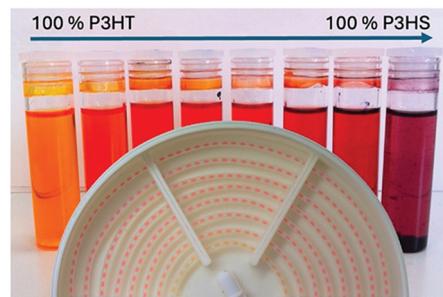
See Martin M. Thuo *et al.*, pp. 770–778.
Image reproduced by permission of Martin Thuo, Julia Chang, Andrew Martin from *Mater. Horiz.*, 2025, 12, 770.

COMMENTARY

668

A reflection on 'Controlled synthesis of conjugated random copolymers in a droplet-based microreactor'

Martin Heeney and John C. de Mello

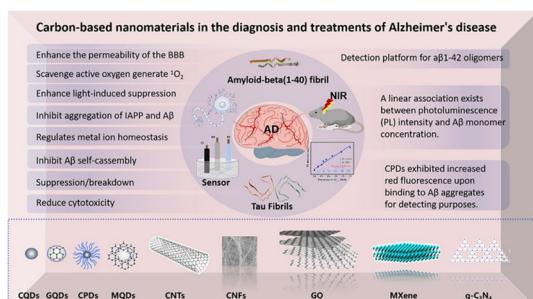


REVIEWS

673

Application of carbon-based nanomaterials in Alzheimer's disease

Mengyao Bai, Xu Shao, Chao Wang, Juanxia Wang, Xin Wang,* Ping Guan* and Xiaoling Hu*



Royal Society of Chemistry approved training courses

Explore your options.
Develop your skills.
Discover learning
that suits you.

**Courses in the classroom,
the lab, or online**

Find something for every
stage of your professional
development. Search our
database by:

- subject area
- location
- event type
- skill level

Members get at least 10% off

Visit rsc.li/cpd-training

**SAVE
10%**

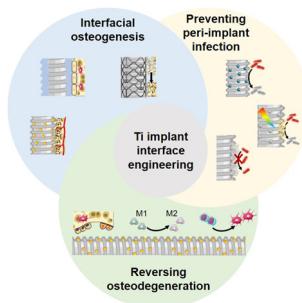


REVIEWS

694

Synthetic nanointerfacial bioengineering of Ti implants: on-demand regulation of implant–bone interactions for enhancing osseointegration

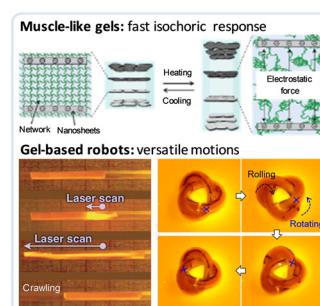
Yilong Dong, Yan Hu, Xinqiang Hu, Lingshuang Wang, Xinkun Shen, Hao Tian, Menghuan Li,* Zhong Luo* and Chunyuan Cai*



719

Muscle-like hydrogels with fast isochoric responses and their applications as soft robots: a minireview

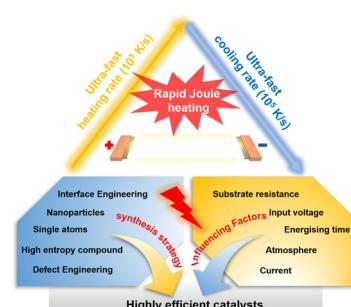
Hui Ying Bai, Qing Li Zhu, Han Lei Cheng, Xin Ling Wen, Zhi Jian Wang,* Qiang Zheng and Zi Liang Wu*



734

Progress and perspectives of rapid Joule heating for the preparation of highly efficient catalysts

Zhan Zhao, Ting Wu, Xiang Li, Yiming Chen and Xiangchao Meng*

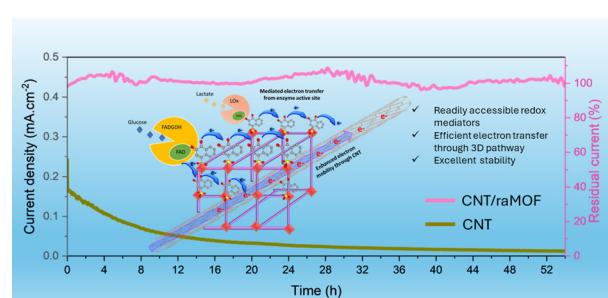


COMMUNICATIONS

760

Rational design of redox active metal organic frameworks for mediated electron transfer of enzymes

Muhammad Rezki, Md Motaher Hossain, Thomas Kouyou Savage, Yoshihide Tokunou and Seiya Tsujimura*

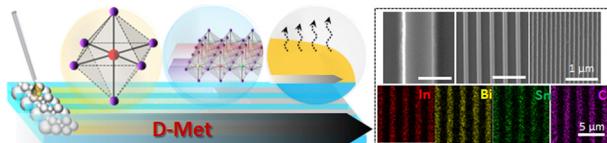


COMMUNICATIONS

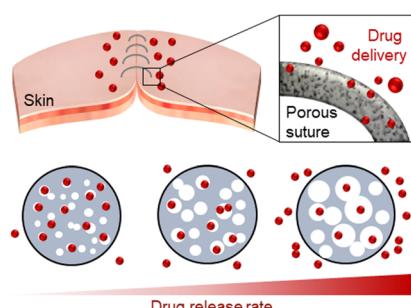
770

Guided *ad infinitum* assembly of mixed-metal oxide arrays from a liquid metal

Julia J. Chang, Chuanshen Du, Dhanush Jamadagni, Alana Pauls, Andrew Martin, Le Wei, Thomas Ward, Meng Lu and Martin M. Thuo*



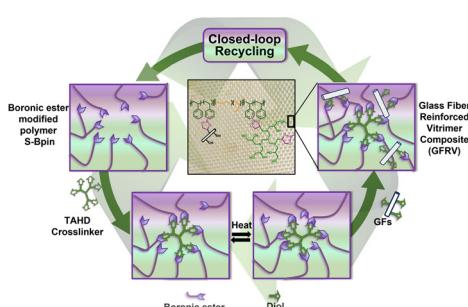
779



Thermally drawn porous sutures for controlled drug release using thermally induced phase separation

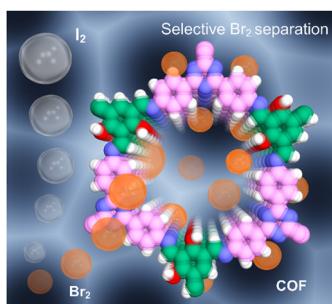
Hyeyoung Seo, Woo Mi Ryu, Jaehyun Jang and Seongjun Park*

788

Tough and circular glass fiber composites *via* a tailored dynamic boronic ester interface

Menisha S. Karunaratne, Md Anisur Rahman,* Guang Yang, Catalin Gainaru, Zoriana Demchuck, Christopher C. Bowland, Harry M. Meyer III, Natasha Ghezawi and Tomonori Saito*

802



Chemically robust functionalized covalent organic framework for the highly efficient and selective separation of bromine

Sahel Fajal, Dipayan Ghosh, Kishalay Biswas, Writakshi Mandal, Nayan Sarkar, Gourab K. Dam, Anirban Roy, Antak Roychowdhury, Dipanjan Majumder, Rajashri R. Urkude, Mandar M. Shirolkar and Sujit K. Ghosh*

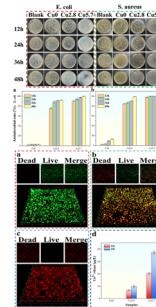


COMMUNICATIONS

814

Fresh insights into structure–function-integrated self-antibacterial Cu-containing Al alloys: giving Al alloys a new function

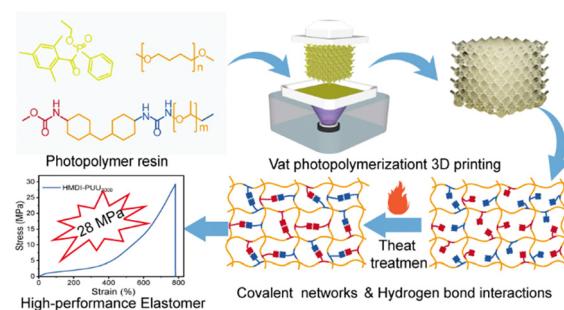
Zhuanzhuan Song, Ying Cai, Xin Li, Ying-Chao Zhao, Dengfeng Yin,* Andrej Atrens and Ming-Chun Zhao*



833

Multiple H-bonds induced mechanically robust vat photopolymerization 3D printing poly(urethane–urea) elastomers

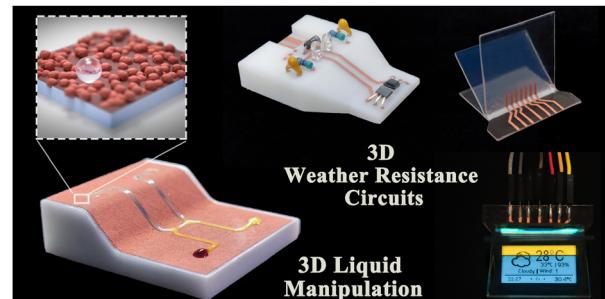
Xingxing Yang, Changcheng Bai, Bin Zhu, Jiayu Wu, Mingyang Wang, Yixian Wang, Tao Wu, Desheng Liu,* Pan Jiang* and Xiaolong Wang*



845

Patternable, high-precision, controllable wettability copper layers for 3D resin-based weather-resistant electronics and 3D liquid manipulation

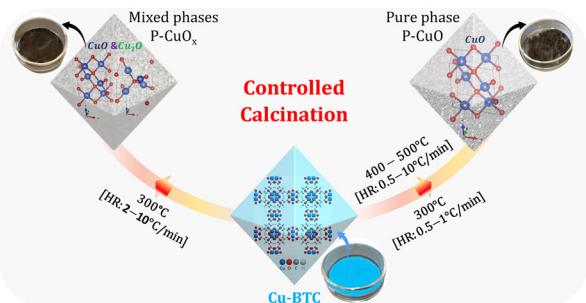
Pengan Luo, Haoran Xu, Hao Lu, Huaiyu Zhao, Siying Li and Tao Zhou*



862

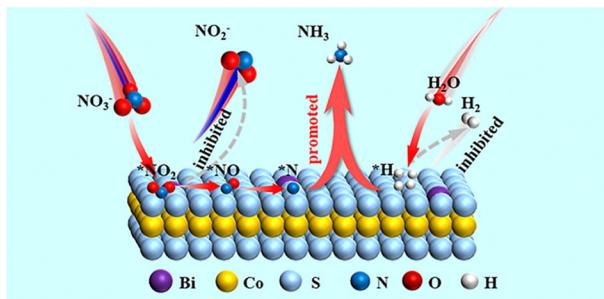
Transformation study and characterization of Cu-BTC MOF-derived nanoporous copper oxide

Sameh Khalil, Abhijit Ganguly, Davide Mariotti and Supriya Chakrabarti*



COMMUNICATIONS

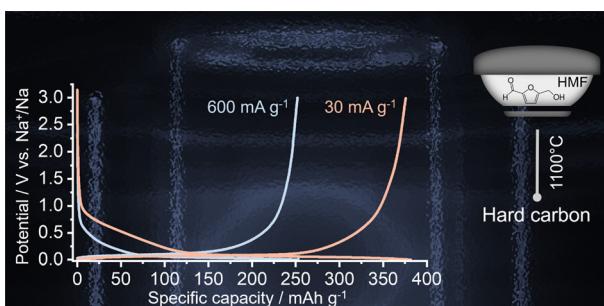
877



Manipulating key intermediates and suppressing the hydrogen evolution reaction *via* dual roles of Bi for high-efficiency nitrate to ammonia and energy conversion

Chunming Yang,* Tingting Wei, Chuantao Wang,* Feng Yue, Xiang Li, Huijuan Pang, Xueyan Zheng, Yantu Zhang* and Feng Fu*

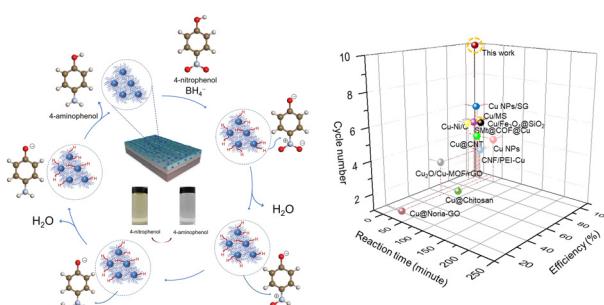
886



Hard carbon from a sugar derivative for next-generation sodium-ion batteries

Enis Oğuzhan Eren,* Evgeny Senokos, Zihan Song, Brinti Mondal, Audrey Perju, Tim Horner, Elif Begüm Yılmaz, Ernesto Scoppola, Pierre-Louis Taberna, Patrice Simon, Markus Antonietti and Paolo Giusto*

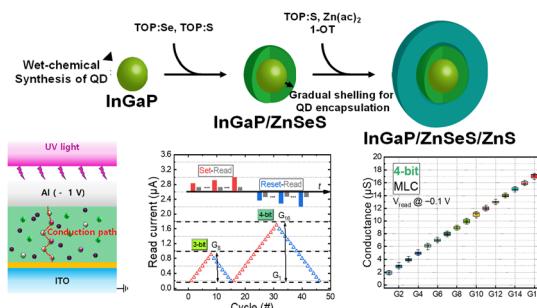
899



Reduction-immobilizing strategy of polymer-embedded sub-2 nm Cu nanoparticles with uniform size and distribution responsible for robust catalytic reactions

Rosy Amalia Kurnia Putri, Wail Al Zoubi,* Bassem Assfour, Abdul Wahab Allaf, Sudiarmanto and Young Gun Ko*

915



Precise weight tuning in quantum dot-based resistive-switching memory for neuromorphic systems

Gyeongpyo Kim, Doheon Yoo, Hyojin So, Seoyoung Park, Sungjoon Kim, Min-Jae Choi* and Sungjun Kim*

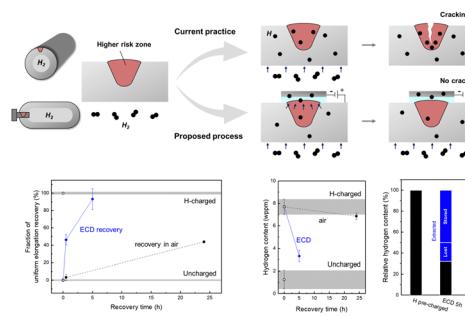


COMMUNICATIONS

926

Remove hydrogen and store it too: an acid-in-clay based electro-chemical solution

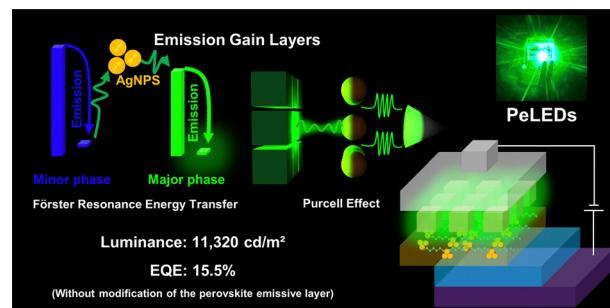
Kyung-Shik Kim, Jin-Sung Park, Young-Chul Yoon, Jinwoo Kim, Ju Li,* Bilge Yildiz* and Cemal Cem Tasan*



935

Framing emission gain layers for perovskite light-emitting diodes using polycaprolactone-silver nanoparticles featuring Förster resonance energy transfer and Purcell effects

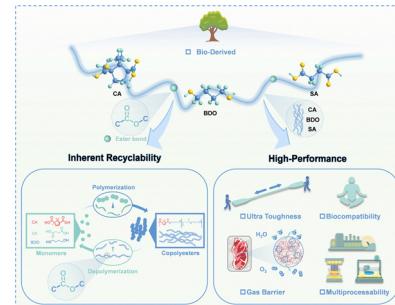
Zhen-Li Yan, Guan-De Wu, Chu-Chen Chueh, Ying-Chi Huang, Bi-Hsuan Lin, Jia-Hau Tsai, Mei-Hsin Chen, Zong-Liang Tseng, Ye Zhou,* Ru-Jong Jeng* and Chi-Ching Kuo*



946

High-performance chemically recyclable multifunctional polyolefin-like biomass-derived polyester materials

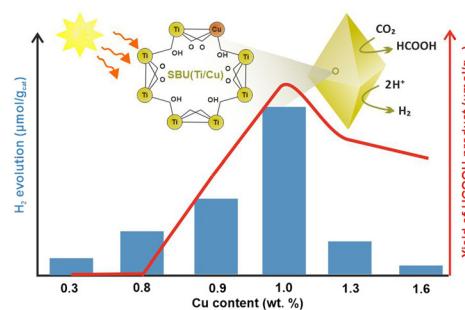
Zheng-Ming Li, Xing-Liang Li,* Yao Li, Yu-Hang Zhang, Teng Fu, Xiu-Li Wang* and Yu-Zhong Wang



957

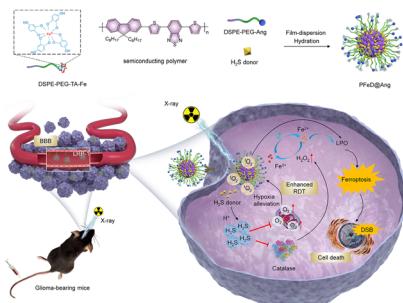
Cu-incorporated NH₂-MIL-125(Ti): a versatile visible-light-driven platform for enhanced photocatalytic H₂ generation and CO₂ photoconversion

Anna Pancielejko,* Mateusz A. Baluk, Hanna Zagórska, Magdalena Miodyńska-Melzer, Anna Gołębiewska, Tomasz Klimczuk, Miroslaw Krawczyk, Miroslawa Pawlyta, Krzysztof Matus, Alicja Mikolajczyk, Henry P. Pinto, Aleksandra Pieczyńska, Joanna Dożonek and Adriana Zaleska-Medynska*



COMMUNICATIONS

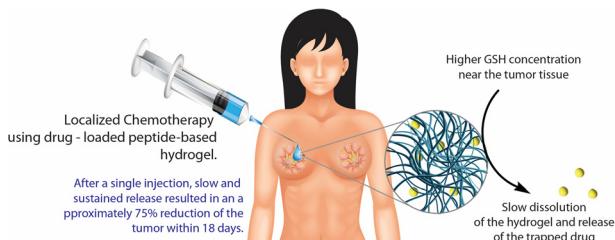
973



Hydrogen sulfide-generating semiconducting polymer nanoparticles for amplified radiodynamic–ferroptosis therapy of orthotopic glioblastoma

Anni Zhu, Shuai Shao, Jinyuan Hu, Wenzhi Tu,*
Zheming Song, Yue Liu, Jiansheng Liu,*
Qin Zhang* and Jingchao Li*

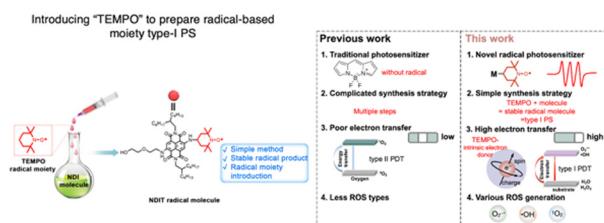
987



Targeted and precise drug delivery using a glutathione-responsive ultra-short peptide-based injectable hydrogel as a breast cancer cure

Satyajit Halder, Tanushree Das, Ritvika Kushwaha,
Anup Kumar Misra, Kuladip Jana* and Debabratim Das*

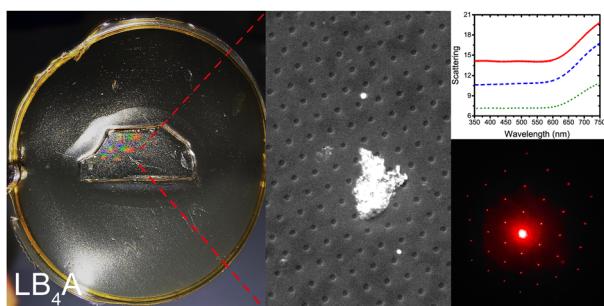
1002



Using a stable radical as an “electron donor” to develop a radical photosensitizer for efficient type-I photodynamic therapy

Xiao Cui, Fang Fang, Huan Chen, Chen Cao,
Yafang Xiao, Shuang Tian, Jinfeng Zhang,*
Shengliang Li* and Chun-Sing Lee*

1008



Biological metasurfaces based on tailored Luria Bertani Agar growth medium formulations for photonic applications

Francesca Leone, Olga Favale, Mauro Daniel Luigi Bruno,
Roberto Bartolino, Ferdinanda Annesi,*
Vincenzo Caligiuri* and Antonio De Luca*



CORRECTION

1018

Correction: Application of carbon-based nanomaterials in Alzheimer's disease

Mengyao Bai, Xu Shao, Chao Wang, Juanxia Wang, Xin Wang,* Ping Guan* and Xiaoling Hu*

