

Materials Horizons

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See Jinfeng Xu, Liqiang Zhou, Yingying Liu *et al.*, pp. 1261–1276. Image reproduced by permission of Jinfeng Xu, Liqiang Zhou, Yingying Liu from *Mater. Horiz.*, 2026, 13, 1261.



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See Yuki Nagai, Yoichi Kobayashi *et al.*, pp. 1277–1280. Image reproduced by permission of Yuki Nagai from *Mater. Horiz.*, 2026, 13, 1277.

EDITORIAL

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Materials Horizons Emerging Investigator Series:
Dr Ankan Dutta Chowdhury, Amity University
Kolkata, India

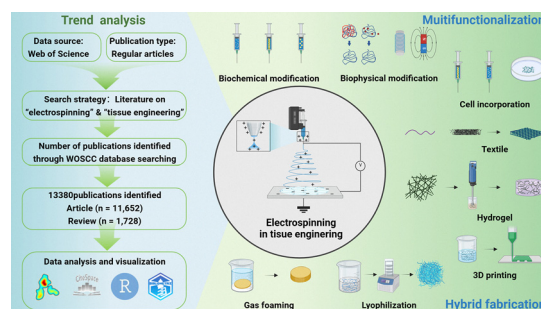


REVIEWS

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Advancing electrospun nanofiber scaffolds for next-generation tissue engineering: from trend analysis to multifunctionalization and hybrid fabrication

Zhuowen Hao, Minchao Dong, Ying Wang, Zepu Wang, Zheyuan Zhang, Jiayao Chen, Renxin Chen, Zouwei Li, Junwu Wang, Guang Shi, Xin Wang,* Xin Zhao* and Jingfeng Li*



EES Catalysis

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Fundamental questions
Elemental answers

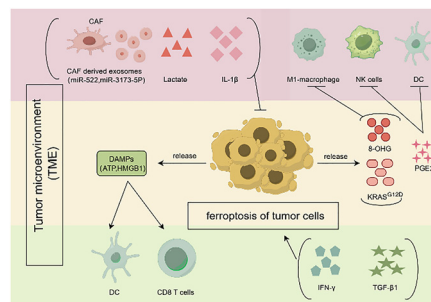


REVIEWS

1138

Nanoplatforms synchronously activating tumor cell ferroptosis and remodeling the tumor microenvironment for reinforced cancer therapeutics

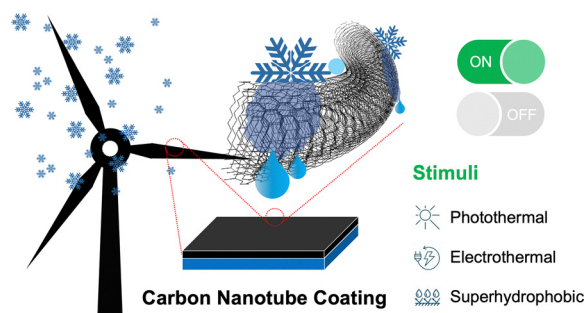
Xiaoye Yang, Chuanxiu Zhu, Teng Zhang and Yu Zhang*



1165

Carbon nanotube-enabled coatings for advanced anti-icing and deicing applications

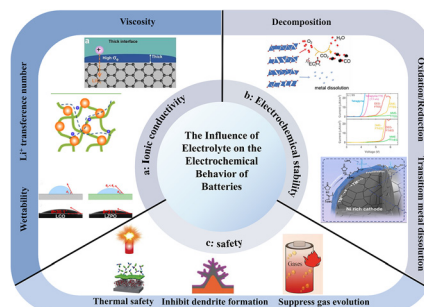
Monika Tarnowska, Artur P. Terzyk, Joanna Kujawa and Sławomir Boncel*



1203

Molecular tailoring of electrolyte solvents for high-performance lithium–metal batteries beyond temperature and voltage boundaries

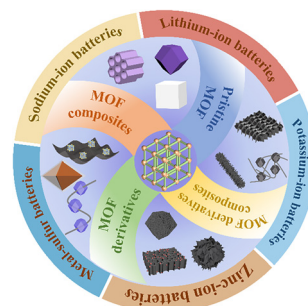
Dejie Qu, Youlong Sun, Tao Liu,* Guicun Li, Yuewei Yan, Tiantian Dong, Lang Huang, Gaojie Xu, Aobing Du, Lei Hu,* Shanmu Dong, Bo Tang* and Guanglei Cui*



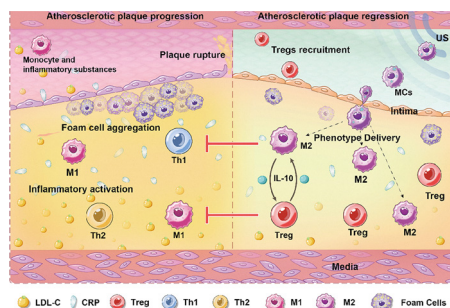
1227

Metal–organic frameworks and derivatives as next-generation materials for electrochemical energy storage

Xuejie Wang, Zhuang Du, Haiwei Tang, Weilai Yu* and Tao Liu*



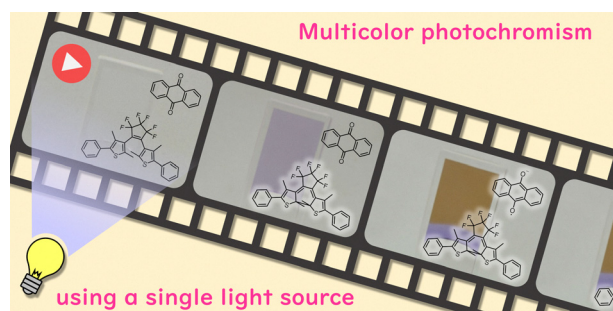
1261



Metabolic-switch macrophage cyborgs reverse atherosclerosis by photoacoustic-directed on-demand phenotype delivery

Wei Zeng, Weimin Fang, Yuhang Mao, Yalan Huang, Yan Lin, Leilei Wu, Anqi Chen, Zhengan Huang, Yuanyuan Sheng, Xiaoxuan Lin, Jiayu Ye, Yanbin Guo, Guanxi Wen, Jian Zeng, Jinfeng Xu,* Liqiang Zhou* and Yingying Liu*

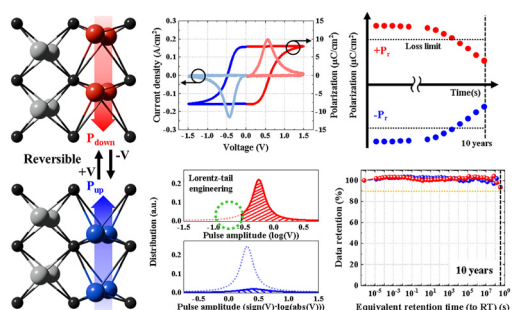
1277



A multicolor photochromic gel based on temporal separation of photochemical reactions

Yuki Nakai, Yuki Nagai,* Yukihiro Furukawa and Yoichi Kobayashi*

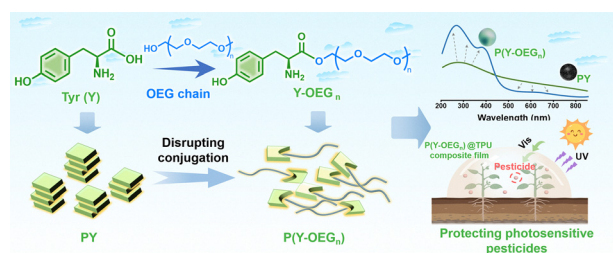
1281



Lorentz-tail engineering toward over 10-year data retention with minimum loss in ferroelectric HZO

Wonwoo Kho and Seung-Eon Ahn*

1289



Direct polymerization of tyrosine conjugates into melanin-like polymers for efficient protection of photosensitive pesticides

Zikun Zou, Ting Zhang, Banggan Luo, Jingyu Wang, Rong Zhang, Xueqian Zhang, Zhen Yang* and Yiwen Li*

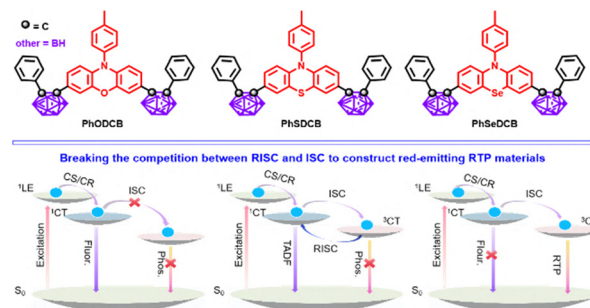


COMMUNICATIONS

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Controlling the intersystem crossing/reverse intersystem crossing (ISC/RISC) competition to achieve efficient red metal-free phosphorescent molecules

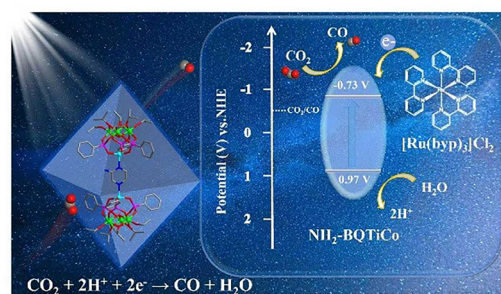
Daokun Zhong, Ruiqin Zhu, Zhao Feng, Jie Zhang, Bochao Su, Yuanhui Sun, Xiaolong Yang,* Ling Yue* and Guijiang Zhou*



1313

A bioinspired polyoxo-titanium cluster for efficient photocatalytic CO₂ reduction assisted by hydrogen bonding

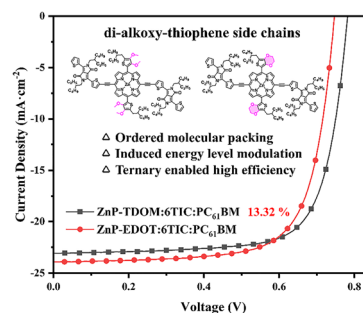
Shiming Zhang, Guoxiang Zhao, Yayu Yan, Qiao-Hong Li, Hai-Xia Zhang, Xin Wu* and Jian Zhang*



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Porphyrins with di-alkoxy-thiophene side chains for organic solar cells

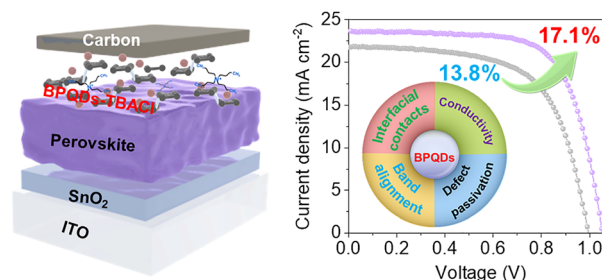
Jifa Wu, Ziqin He and Xiaobin Peng*



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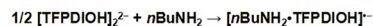
Interface engineering via pre-engineered black phosphorus quantum dots for highly efficient carbon-based hole-transport-layer-free perovskite solar cells

Yi-Ping Zhang, Xinwei Li, Aohan Mei, Guoge Zhang, Shenghuang Lin,* Jun Du and Nianqing Fu*



COMMUNICATIONS

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LBHB-Driven Disaggregation

Steric Hindrance
Weaken π -stacking in pimer

Fluorine Effect
Enhanced hydroxyl acidity for LBHB

3c-4e Bonding
Short N...O distance, high ρ_{BCP}

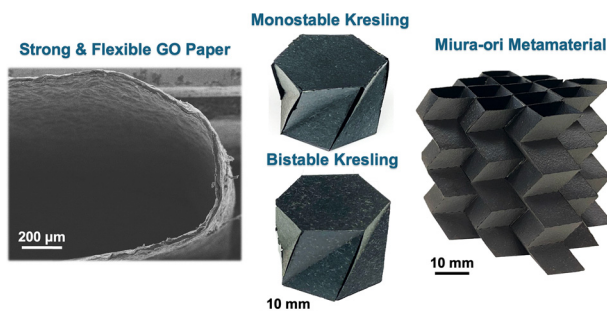
LBHB Formation
Nearly barrierless proton transfer

 π -Radical-Based Organic Sensors

Unveiling the sensing mechanism at the molecular level: a DFT study on the disaggregation of perylene diimide radical anion pimers

Hanlin Gan, Haiquan Zhang,* Yuguang Ma and Qinglin Jiang*

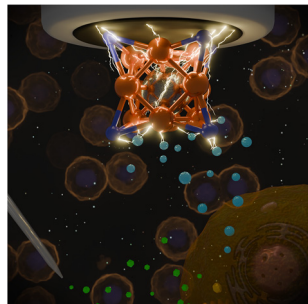
1350



Strong and flexible graphene oxide paper for humidity responsive origami metamaterials

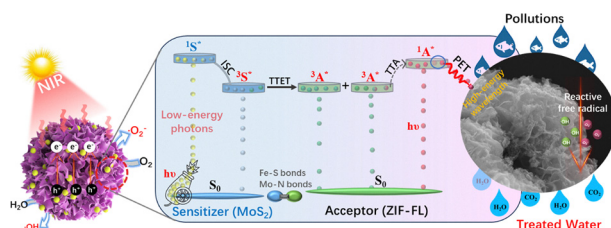
Yiwen Chen, Jun Cai, Alireza Seyedkanani, Abdolhamid Akbarzadeh* and Marta Cerruti

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Cu₃N–Fe nanocube-based electrochemical sensing of cancer metabolites with minute-scale response time

Uddipan Dasgupta, Malabika Ghosh, Sambanduram Samarjit Singh, Vineet Kumar Mishra, Suvendu Maji, Madhusudan Das, Amit Ranjan Maity, Payel Chakraborty, Souvik Ghatak and Ankan Dutta Chowdhury*

1375



Nano energy amplifier – the proposal and demonstration of triplet–triplet annihilation upconversion heterojunctions for photocatalysis using low-energy photons

Yufan Lan, Xiao Luo,* Zhiqiang Yu, Wuli Han and Xing Zhou

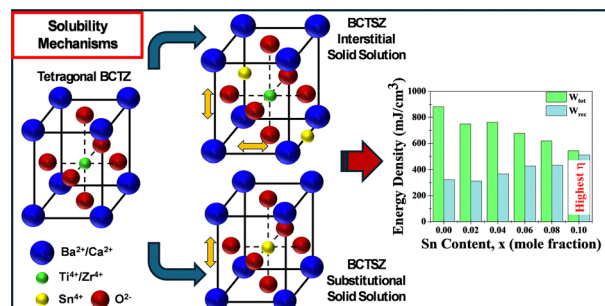


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Effects of Sn⁴⁺ solid solubility mechanisms on the electromechanical and energy storage performance of (Ba_{0.85}Ca_{0.15})(Ti_{0.92}Zr_{0.08})O₃

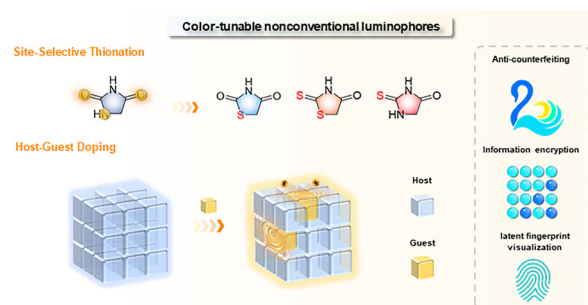
Tasmia Zaman,* Saroj Kumar Bhattacharyya, Sajjad Seifi Mofarah, Pramod Koshy and Charles Christopher Sorrell



1412

Site-selective thionation and doping enabled tunable full-color emission in nonconventional luminophores

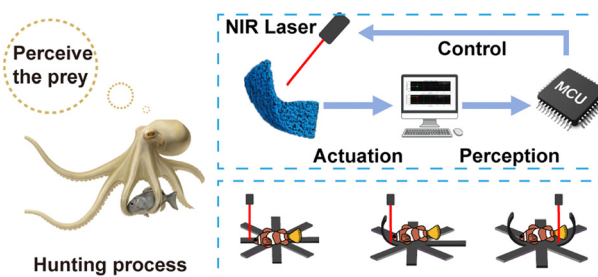
Xiang Chen, Siyu Tao, Ruijia Chen, Zihao Zhao, Qiang Zhang, Anze Li, Guangxin Yang, Wenbin Liu* and Wang Zhang Yuan*



1421

Integrated conductive hydrogel soft actuators for remote photothermal actuation and multimodal self-sensing

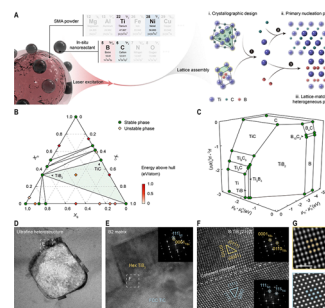
Ping Guo, Jie Zhou, Chengnan Qian, Wenjie Cao, Yang Yu, Lin Cheng, Daoyou Guo, Huaping Wu* and Aiping Liu*



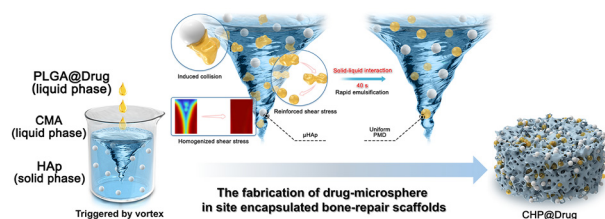
1433

In situ nanoscale heterostructure engineering for additive manufacturing of dynamic adaptive alloys

Junchao Yi and Gary J. Cheng*



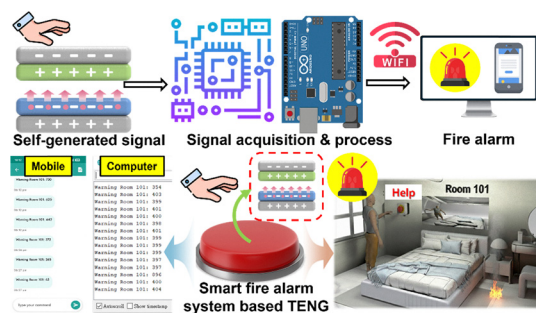
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Leveraging solid–liquid interaction to fabricate drug-microsphere in site encapsulated bone-repair scaffolds

Fengxin Zhao, Puxin Liu, Xinyi Wang, Jirong Yang,* Changshun Ruan,* Dongxiao Li, Xiangdong Zhu, Yumei Xiao* and Xingdong Zhang

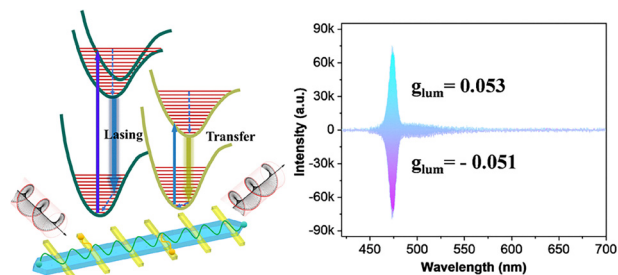
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Developing real-time IoT-enabled next-generation fire alarm systems using $\text{SrBi}_4\text{Ti}_4\text{O}_{15}$ /PDMS flexible triboelectric nanogenerators

Gokana Mohana Rani, S. V. N. Pammi, Hanseung Kim, Hyun Soo Ahn, Ying Chieh Hu, Jong Hoon Jung, Reddicherla Umapathi* and Yun Suk Huh*

1477

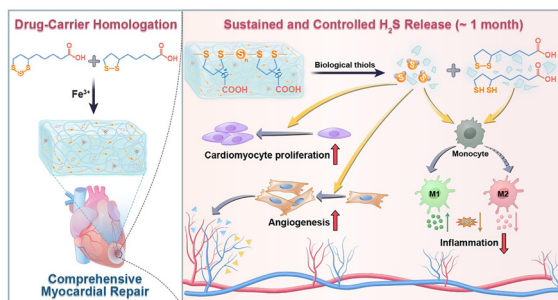


Organic Branched Heterostructures: From Chiral Transfer to Chiral Lasing

Chiral-polarized photonic chips via organic crystal heterojunctions

Ya-Cheng Li, Hui-Ying Liu,* Rui-Lin Yang, Fan Li, Xiao-Ning Wang, Xiao-Bin Chen, Xiu-Qi Chen, Hongbing Fu and Chun-Lin Sun*

1484



A "drug-carrier homologation" cardiac patch for myocardial infarction therapy via month-long controlled H_2S release

Pengfei Li, Ruilin Lu, Jingsong Yi, Yangyang Cheng* and Shiyong Zhang*

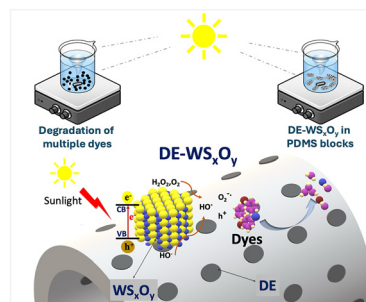


COMMUNICATIONS

1493

A solar-light driven h-WO₃/2H-WS₂-microalgae derived photocatalyst for rapid multi-dye degradation

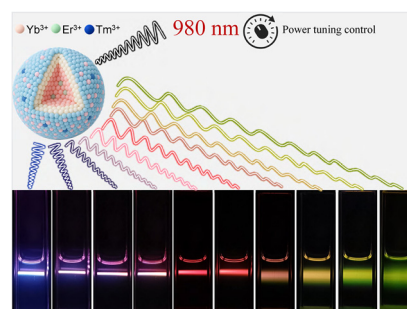
Shrinath Bhat, U. T. Uthappa,* Shervin Kabiri, Heon-Ho Jeong* and Mahaveer D. Kurkuri*



1508

Power-tunable multicolor upconversion in nanocrystals under single-wavelength excitation

Raheel Ahmed Janjua, Li Xu, Xinyu Wang, Joan J. Carvajal, Ruili Zhang, Lu Liu* and Sailing He*



1517

Recyclable near-body temperature eutectic system with double positive temperature coefficient effect for personalised thermal regulation

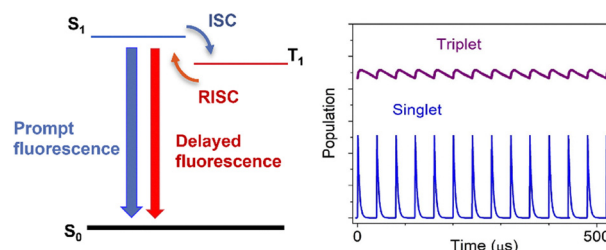
Hongxu Guo, Lichang Lu, Kairen Zhao, Huaiyu Yang, Helen Willcock, Elisa Mele, Xujin Bao, Eileen Yu, Han Zhang and Yi Liu*



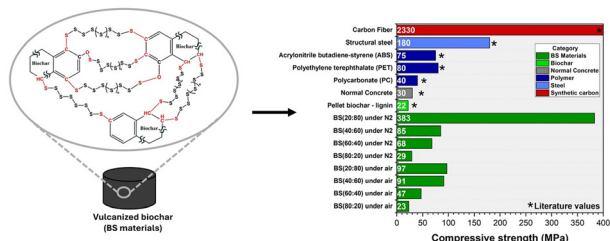
1532

Method for measuring exciton–exciton annihilation rate constants in thermally activated delayed fluorescent emitters to understand efficiency roll-off in OLEDs

Le Zhang, Arvydas Ruseckas,* Kou Yoshida, Liam G. King, Subeesh Madayanad Suresh, Eli Zysman-Colman* and Ifor D. W. Samuel*



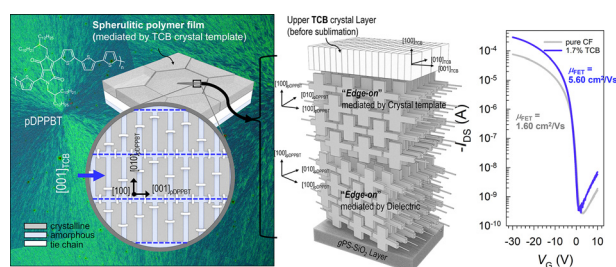
1540



Materials derived from a sulfur vulcanization of biochar

Chaza Al Akoumy, Mohamed Amine Mezour and Richard Martel*

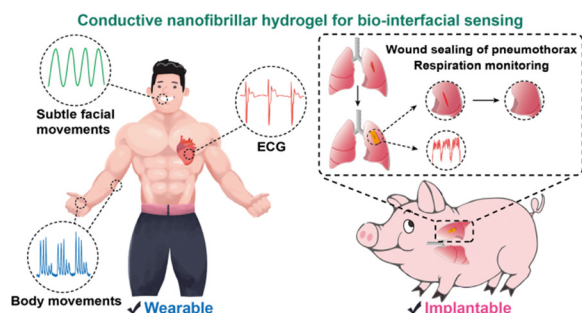
1552



Template-guided self-assembly of semiconducting polymers in crystallizable solvent-induced nanoconfinement

Hoichang Yang* and Sohyun Choi

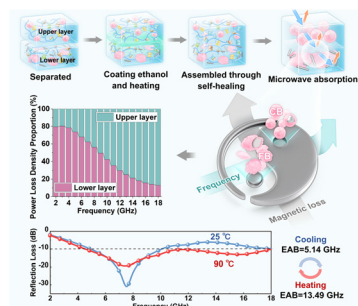
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Nanofibrillar conductive hydrogel adhesive for soft bioelectronic interfaces

Yibo Huang, Shuo Sun, Chunhui Li, Shunpu Yang, Tao Wang,* Lin Wang* and Yunhua Chen*

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Dual-layer self-healing composites with temperature-responsive intelligent broadband microwave absorption

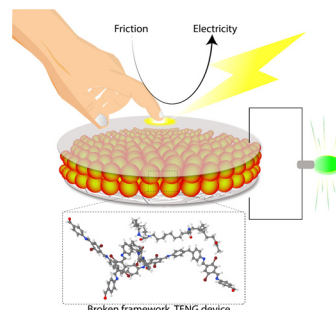
Xiao Yan, Hengfeng Zhao, Fang Liu, Chi Yu, Xinghua Jiang and Jianhua Guo*



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A polarized broken framework for electrical energy harvesting from mechanical friction

Abdul Khayum Mohammed, Jelmy Elavathingal Johny, José Ignacio Martinez, Mahira Bashri, Nada Elmerhi, Sithara Radhakrishnan, Ammar Nayfeh, Honey John* and Dinesh Shetty*



1603

Development of a whole cell vaccine to activate dendritic cells using polyvalent CpG

Hongyun Han, Dongrun Yu, Peng Shi, Hongdian Zhang and Huizhen Jia*

