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Journal of Materials Chemistry C

Materials for optical, magnetic and electronic devices

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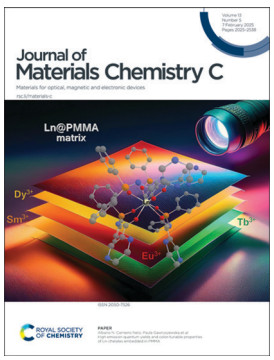
ISSN 2050–7526 CODEN JMCCCX 13(5) 2025–2538 (2025)



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REVIEWS

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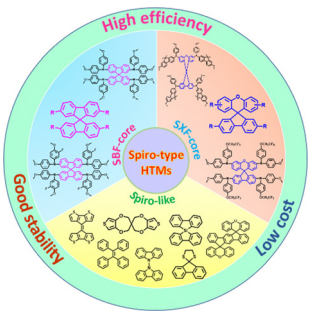
Recent progress in spiro-type hole transport materials for efficient and stable perovskite solar cells

Gang Xie, Ling Chen, Jiaxin Liu, Jianxin Yu, Haoran Yin, Huiyu Li, Yonglong Yang, Aihui Liang* and Yiwang Chen*



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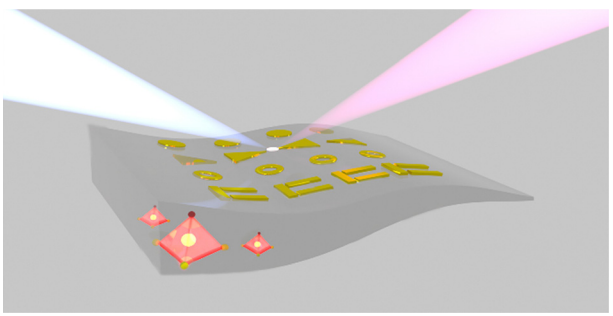
Flexible mechano-optical sensors from mechanoluminescence to mechanoplasmonics: designs, applications, and prospects

Wei Tao, Yufeng Xue, Qinhua Hu,* Ling Yin,* Ye Liu,* Thomas Maurer and Monika Fleischer



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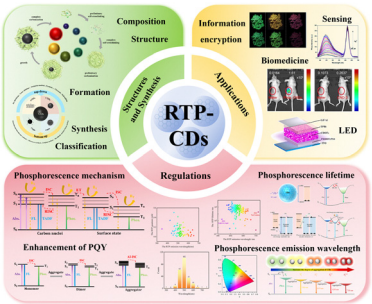
REVIEWS

2091

Advances in the syntheses, mechanisms and applications of room-temperature phosphorescent carbon dots

Feng Lu, Xinhuan Xu, Weizheng Wan, Xiumin Liang, Jiajing Xia, Weizhong Cao, Zhaopeng Chen and Min Hu*



PERSPECTIVE

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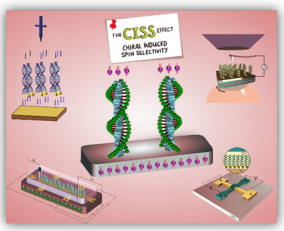
Recent advancements in chiral spintronics: from molecular-level insights to device applications. A prospect based on the interplay between physical and chemical properties of chiral systems

Suryakant Mishra,* Andrew C. Jones* and Claudio Fontanesi*



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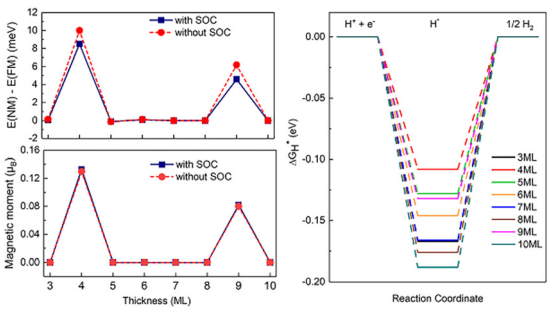
COMMUNICATION

2135

Thickness-dependent hydrogen evolution reaction activity on Pd films: an insightful view from magnetism

Dong-Xue Liu, Hong Hong, Qingqi Cao, Dunhui Wang* and Youwei Du



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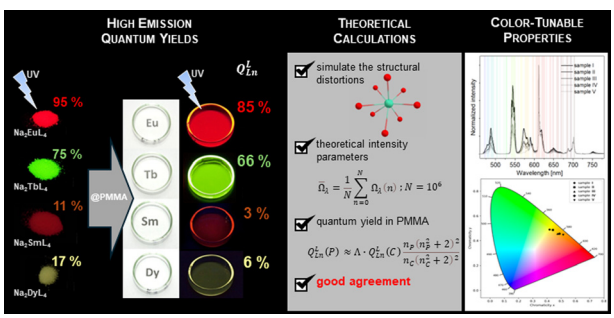
High emission quantum yields and color-tunable properties of Ln-chelates embedded in PMMA

Aneta Lipa, Yen Hoang Pham, Albano N. Carneiro Neto,* Viktor A. Trush, Huanrong Li, Oscar L. Malta, Volodymyr M. Amirkhanov and Paula Gawryszewska*



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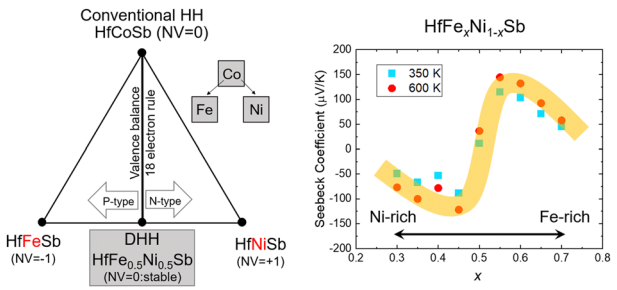

Effects of the Fe/Ni ratio in double half-Heusler composition $HfFe_{1-x}Ni_xSb$

Kazuki Imasato,* Philipp Sauerschnig, Masanobu Miyata, Takao Ishida, Atsushi Yamamoto and Michihiro Ohta

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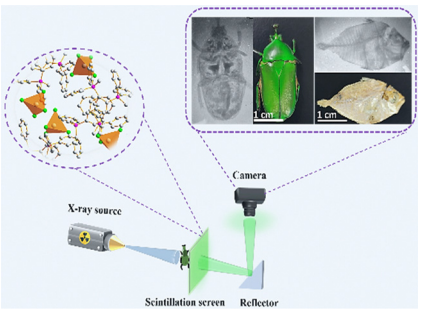

Single crystals of organometallic manganese halides as sustainable high-luminescence materials for X-ray scintillation

Azimet A. Karluk, Simil Thomas, Aleksander Shkurenko, Bashir E. Hasanov, Javeed Mahmood,* Mohamed Eddaoudi* and Cafer T. Yavuz*

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Investigating the effect of hydrothermal carbonisation reaction times on the photoluminescence of bio-oil-derived carbon polymer dots

Lawrence A. Bruce, Liam Desmond, Abigail A. Seddon, Leon Bowen, Greg A. Mutch, Anh N. Phan* and Elizabeth A. Gibson*

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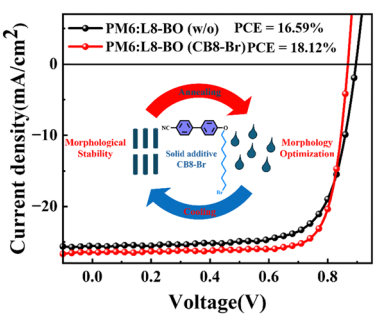

A mesogenic unit based low melting point solid additive for efficient and stable organic solar cells

Jiali Wang, Qian Xie,* Jie Fang, Dongdong Xia, Yuefeng Zhang, Chunyu Qiao, Yu Xie,* Shengyong You, Lang Jiang,* Weiwei Li and Chaowei Zhao*

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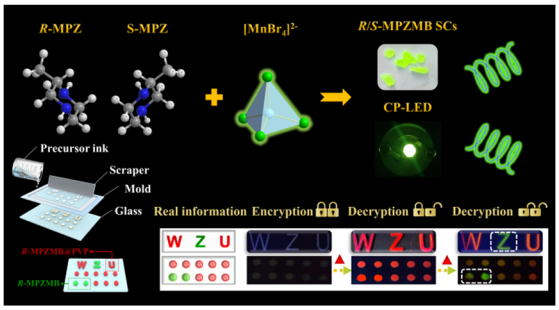
Switchable circularly polarized luminescent Mn-based hybrid metal halides

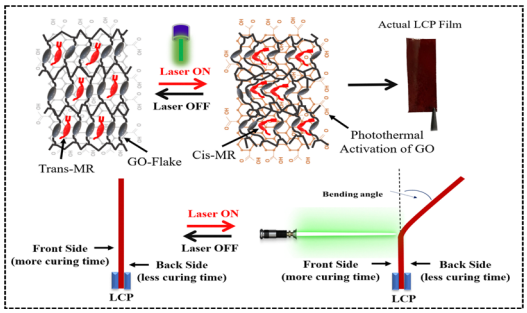
Xuexia Yu, Songbing Zhong, Zeyi Guo, Jia Guan, Hao Tang, Xiaolong He,* Yihuang Chen* and Shuang Pan*



2198

Reversible photomechanical actuators with liquid crystal polymer graphene oxide nanocomposites

Guan-Ting Li, Chia-Hsien Hsu, Bhupendra Pratap Singh and Shug-June Hwang*



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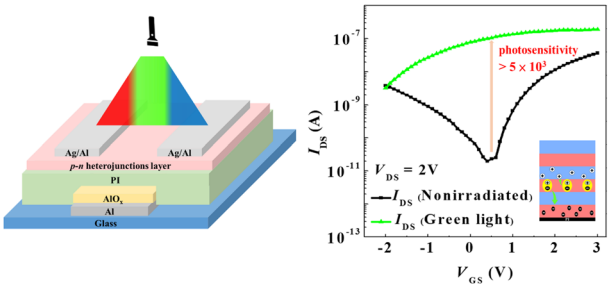
High-performance organic thin-film phototransistors based on stacked p–n heterojunctions for enhanced optoelectronic response

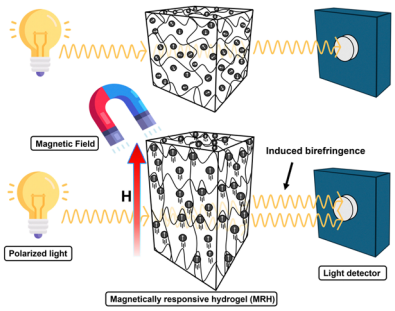
Po-Hsiang Fang, Zhao-Lun Kuo, Yu-Tong Wu, Horng-Long Cheng and Wei-Yang Chou*



2219

Magnetically induced stress birefringence in stimuli-responsive hydrogels

M. A. Arranz,* C. M. Andreu, J. Román and E. Vázquez



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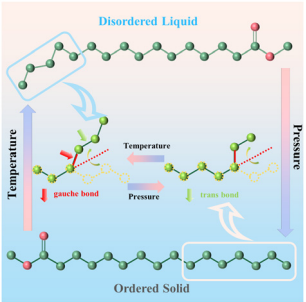

Colossal barocaloric effect in fatty acid methyl esters

Diyi Fu, Xiu Su, Haoyu Wang, Zhenxing Li, Qiang Zheng,* Jun Shen, Bing Li and Juan Du*

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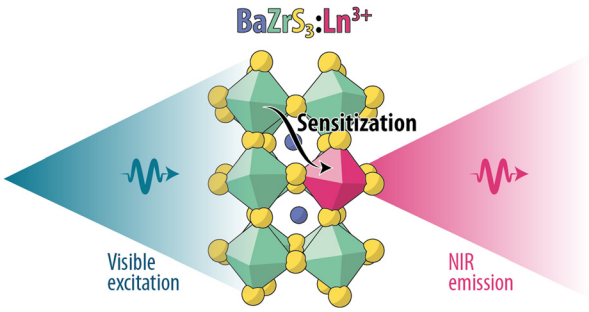

Sensitized near-infrared lanthanide emission in chalcogenide perovskites

Jinan H. Al Shuhaib, Isabel J. Ferrer, José R. Ares, Salvatore Cianci, Federico Tuzi, Elena Blundo, Antonio Polimeni, Antonio Benayas, Riccardo Marin* and Fabrice Leardini*

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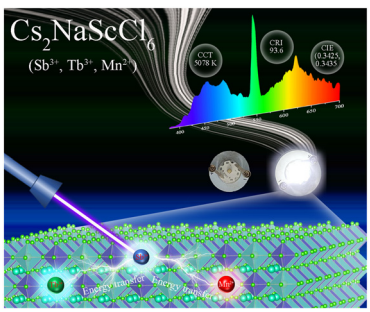

High quality white light emission from Sb^{3+}, Tb^{3+} and Mn^{2+} co-doped $Cs_2NaScCl_6$ double perovskites

Deyuan Yang, Ruirui Cui and Chaoyong Deng*

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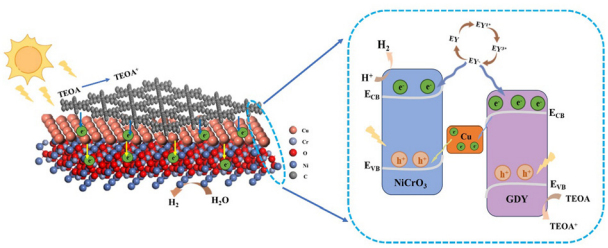

Design of a photocatalyst combining graphdiyne–Cu/$NiCrO_3$ with Cu as an interfacial charge-transfer bridge and investigation of its photocatalytic hydrogen evolution performance

Lu Ding and Zhiliang Jin*

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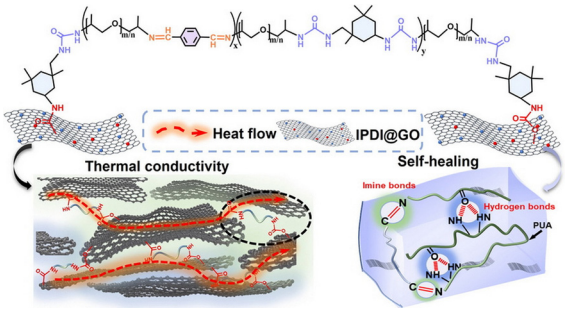
A polyurea interface structure with dual dynamic bonds endowing composites with synchronous self-healing and thermal conductivity properties

Shuang Geng, Bin Wu,* Yan Wu, Ping Yu, Ru Xia* and Jiasheng Qian



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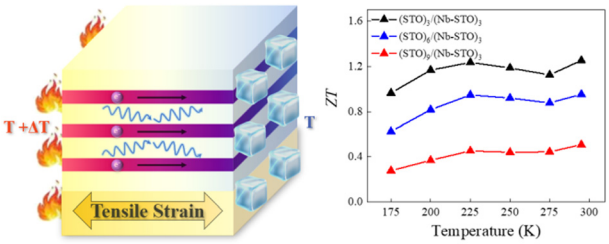
Boosting room-temperature thermoelectricity in $SrTiO_3$-based superlattices

Yi Zhu, Wenzhao Wang, Bokai Liang, Wei Liu, Tao Zhou, Biwei Meng, Hao Liu, Wenping Gao, Yulong Yang, Chang Niu, Changlin Zheng, Zhenhua An, Shiwei Wu, Weitao Liu, Yuqiao Zhang, Chao Yuan,* Yinyan Zhu,* Lifeng Yin* and Jian Shen*



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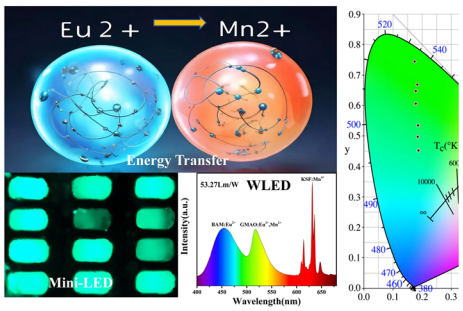
Efficient narrow-band green phosphors for mini-LED displays using dual strategies of high concentration quenching and energy transfer

Runtian Kang, Takatoshi Seto* and Yuhua Wang*



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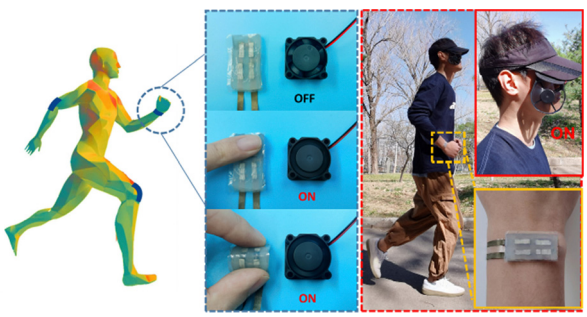
A highly stretchable thermoelectric generator developed from polyaniline-based nanocomposites for body heat harvesting

Guoliang Li, Jingda Zhou, Lu Yang, Yuan Deng and Yao Wang*



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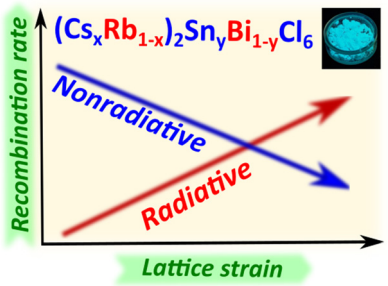

Experimental design of $(Cs,Rb)_2Sn(Bi)Cl_6$ blue phosphors by cation-substitution-induced lattice strain

Oleksandr Stroyuk,* Oleksandra Raievska, Manuel Daum, Christian Kupfer, Andres Osvet, Jens Hauch and Christoph J. Brabec

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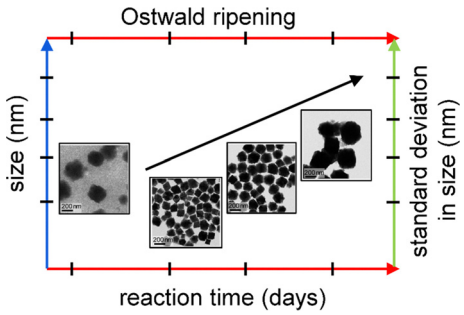

Synthesis by size focusing of lithium tantalate nanoparticles with a tunable second harmonic optical activity

Rana Faryad Ali and Byron D. Gates*

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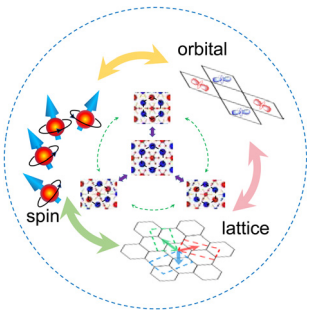
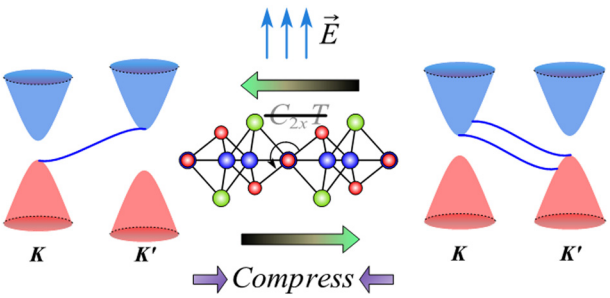


Jahn–Teller distortion induced two-dimensional ferroelasticity in Mn_2CuO_6 monolayers with antiferromagnetic ordering

Xinkai Ding and Gaoyang Gou*

2330



External field-engineered tunable chern number and valley-polarized quantum anomalous hall effect in $Ti_3S_3Te_2$ monolayer

Xiaokang Xu, Jinlian Lu, Huijie Lian, Ying Han, Yongjun Liu, Xueke Yu, Ailei He,* Xiaojing Yao* and Xiuyun Zhang*

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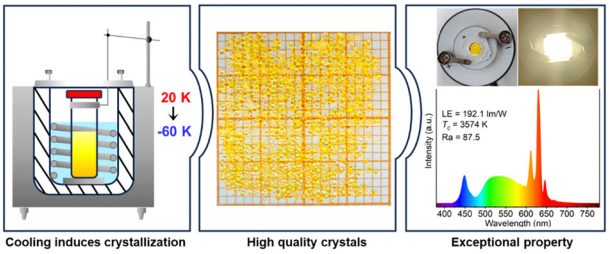
K_2SiF_6:Mn^{4+} red-luminescent crystals with high external quantum efficiency (EQE_{max} of 78%) and high thermal quenching temperature ($T_{1/2}$ > 500 K) enabling high brightness warm white LEDs

Wenrui Zhang, Yayun Zhou,* Ce Shi,* Jiajun Ren, Liying Zhang and Haipeng Ji*



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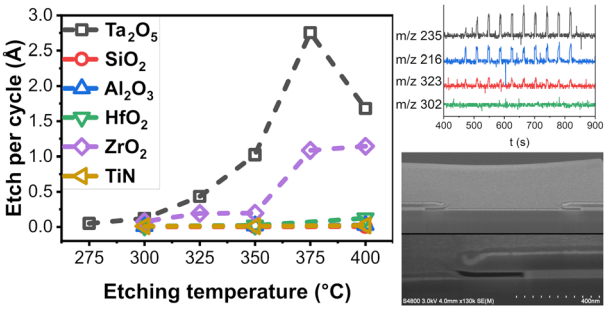
Selective gas phase pulsed etching of oxides with $NbCl_5$

Juha Ojala,* Marko Vehkamäki, Mykhailo Chundak, Anton Vihervaara, Kenichiro Mizohata and Mikko Ritala*



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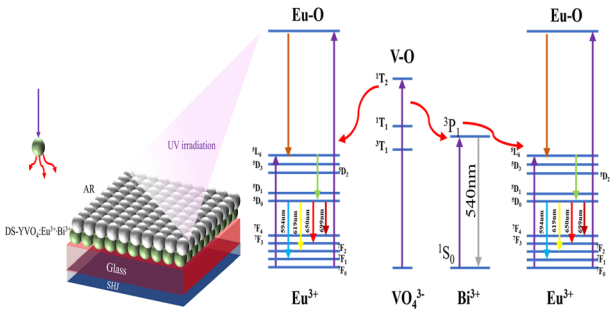
Application of downshifting and antireflection stacked layers synthesized using a wet chemistry method with broad UV excitation for silicon heterojunction solar cells

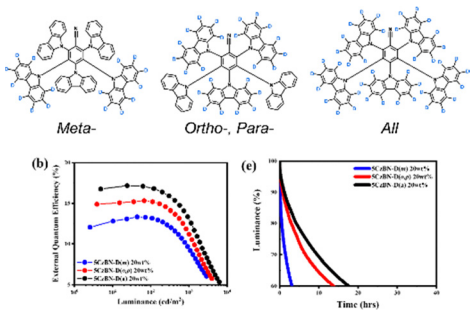
Xiaowen Zhao, Chuangen Xu, Jindi Wei, Haobo Wang, RuiPeng Yang, Xiaoliang Wang* and Xiaojun Ye*



2367

The effect of positional deuterium substitution on the acceptor moiety for TADF

Da Yeon Shin, Jun Sung Lee, Jeong-Yeol Yoo, Jong-Kwan Bin* and Chil Won Lee*



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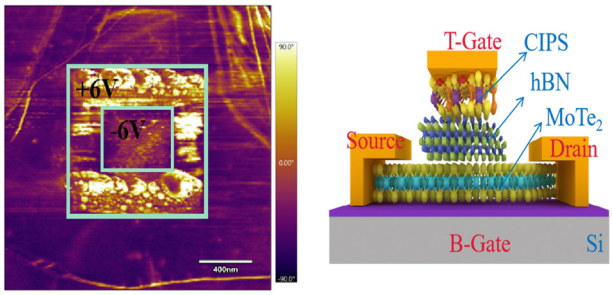

Two dimensional $CuInP_2S_6$/h-BN/$MoTe_2$ van der Waals heterostructure phototransistors with double gate control

Sina Li,* Junjie Zhou, Jingxian Xiong, Sixian Yang, Jielian Zhang, Weijun Fan* and Jingbo Li*

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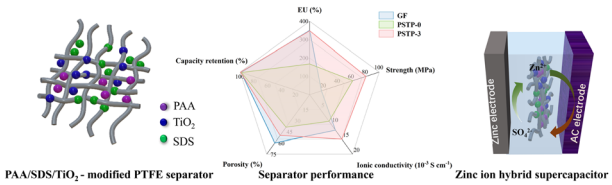

A robust, efficient ion transport polytetrafluoroethylene fibrous membrane-based separator with superior stability for ultralong-life zinc ion hybrid supercapacitors

Zhiqian Wei, Biao Huang, Lixin Song,* Yijian Chen, Pingfan Du, Hailin Zhu, Jie Xiong and Yuhai Guo*

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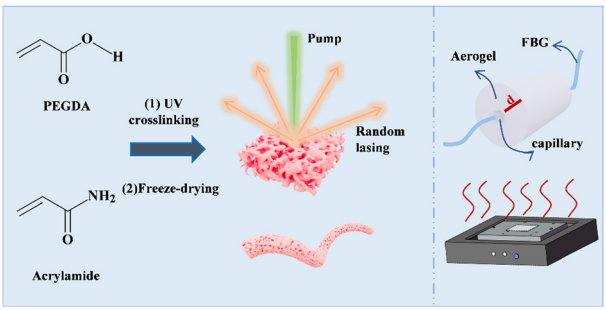

Aerogel for random lasing and sensors with thermal insulation

Zhijia Hu,* Zhiruo Wang, Xiaoyu Li, Guangyin Qu, Zhigang Cao, Siqi Li, Yan Kuai, Jiangying Xia* and Benli Yu

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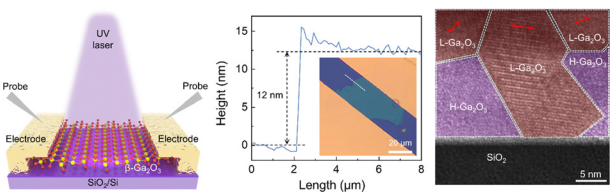

Thickness-dependent quasi-two-dimensional β-Ga_2O_3 solar-blind photodetectors prepared *via* GaSe oxidation

Jianwen Hu, Kexin He, Haoran Long, Yin Hu, Penghong Ci, Yueyang Liu, Jing Zhang, Liyuan Liu, Juehan Yang* and Zhongming Wei*

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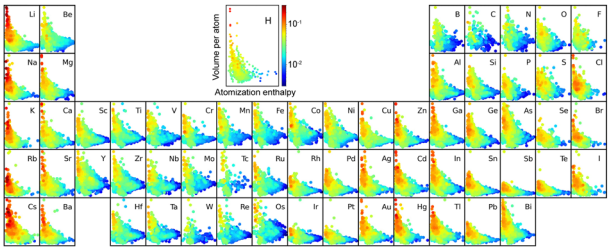
Machine learning-assisted screening of intrinsic rattling compounds with large atomic displacement

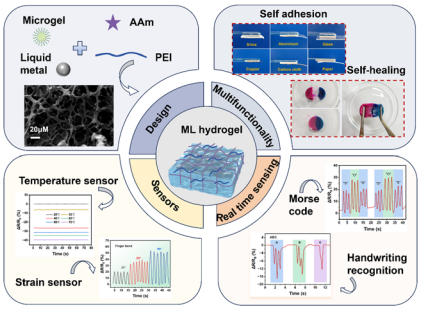
Kunpeng Yuan,* Zhaoxuan Feng, Xiaoliang Zhang and Dawei Tang



2427

Self-healing, adhesive liquid metal hydrogels based on PNIPAM microgels for high-performance temperature and strain sensors

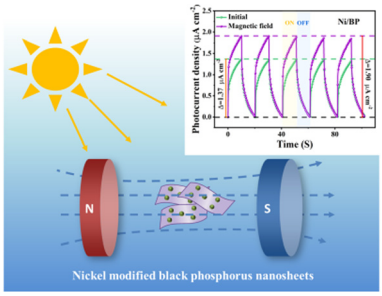
Xiaoyan He,* Penggai Ma, Shuo Ma, Runze Cao, Xin Tian, Yanling Liang, Jing Li, Yuanyuan Lu, Zhiqiang Wang and Xiaoquan Lu*



2440

Highly stable nickel metal-modified black phosphorus-based photodetectors with enhanced magnetic field-assisted photoresponse

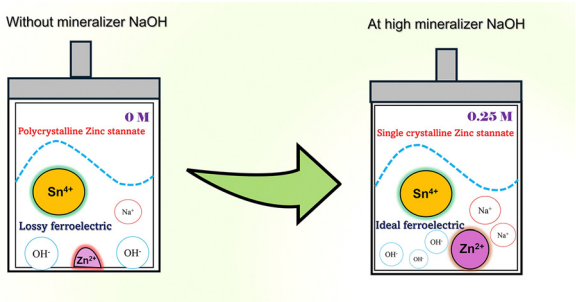
Zhiwen Leng, Xi Zhang, Hui Qiao,* Xi Chen, Siwei Luo, Zongyu Huang, Zhongjun Li, Qiaoliang Bao* and Xiang Qi*



2451

Crystallinity-driven ferroelectric and piezoelectric properties of hydrothermally synthesized zinc stannate: exploring the substantial role of mineralizer NaOH

Anupam Chowdhury, S. Wazed Ali* and Bipin Kumar*



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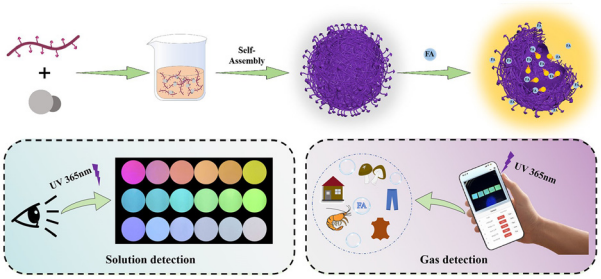
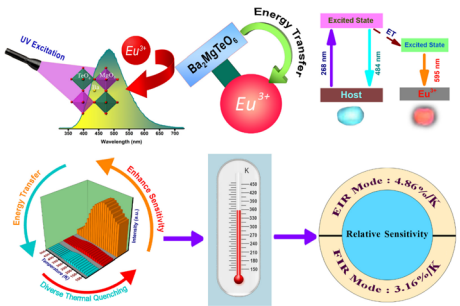
2459



The self-assembly of polyacrylic acid nanoparticles induced by non-covalent interactions enhances the response of molecular fluorescent probes to formaldehyde

Qingxin Han,* Ruyun Sun, Xuechuan Wang, Lulu Ning, Luming Chen, Xiaoling Ling and Xiaoyu Guan*

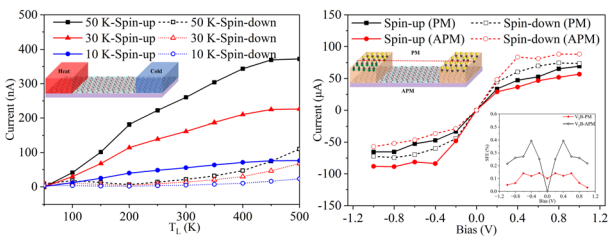
2470



Integrating unwonted photoluminescence and anti-thermal quenching in Ba_2MgTeO_6 double perovskites for high-performance optical thermometers

Nithin Jayan Suraja, Amrithakrishnan Bindhu, Sibi Kaithakkal Solaman and Subodh Ganesanpotti*

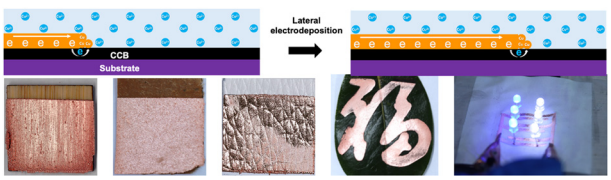
2485



Tunable spin transport and spin-dependent Seebeck effect in boron-based two-dimensional MBene transition metal compounds

Cuicui Sun, Yuxiu Wang,* Haocheng Zhang, Yue Sun, Zhongteng Liu, Xuanchen Zhou and Guiling Zhang*

2499



Carbon black-induced edge guided-metal lateral electrodeposition and its application in paper-based flexible electronic devices

Xuanzhang Li, Weiwei Ni, Danting Song, Chuanyu Zhou, Ying Ze, Wenfeng Ying, Huibin Sun* and Wei Huang

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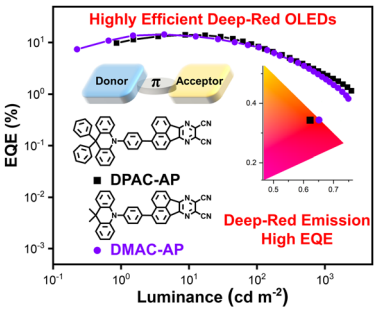
2508

Highly efficient deep-red organic light emitting diodes based on acenaphthopyrazine derivatives *via* π-bridge with thermally activated delayed fluorescence

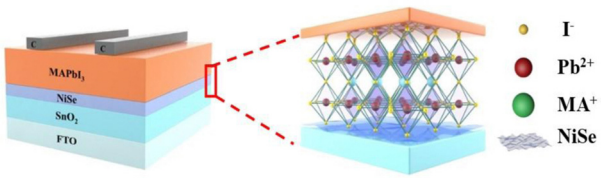
Zhuang Cheng, Xin He, Hui Liu, Shuyuan Ge, Yixuan Jiang, Futong Liu and Ping Lu*



2517

A NiSe layer enhanced the efficiency of hole-conductor-free $MAPbI_3$ perovskite solar cells

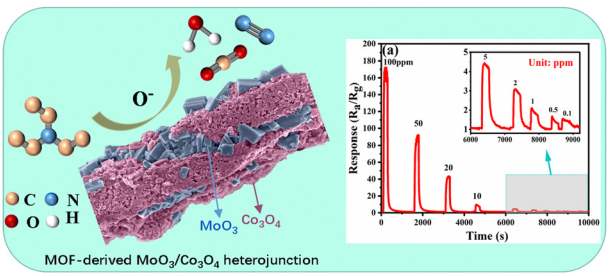
Xiaohui Lu, Xiandong Zhao, Congcong Wu, Shiming Wang, Yanyan Li,* Xiaojie Yang, Yang Li* and Li Zhao*



2524

MOF-derived, carbon-mediated construction of a hierarchical rod-shaped MoO_3/Co_3O_4 heterojunction towards efficient triethylamine detection

Qingmei Zhang, Yuanhui Zhang, Keyi Ge, Fei Huang, Hu Meng and Wei Yang*



RETRACTION

2535

Retraction: Low energy loss (0.42 eV) and efficiency over 15% enabled by non-fullerene acceptors containing *N*-bis(trifluoromethyl)phenylbenzotriazole as the core in binary solar cells

María Privado, Beatriz Donoso, Kanupriya Khandelwal, Rahul Singhal, Fernando G. Guijarro, Ángel Díaz-Ortíz, Pilar Prieto,* Pilar de la Cruz,* Ganesh D. Sharma* and Fernando Langa*