

# Journal of Materials Chemistry C

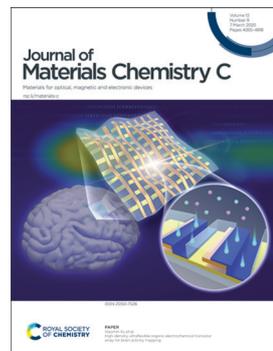
Materials for optical, magnetic and electronic devices

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## IN THIS ISSUE

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## EDITORIAL

4282

### Introduction to rare earth materials

Ashlee J. Howarth,\* Takao Mori\* and Zhiguo Xia\*

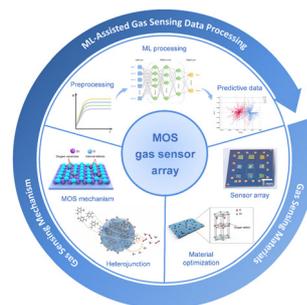


## REVIEWS

4285

### Advances in metal oxide semiconductor gas sensor arrays based on machine learning algorithms

Jiayue Han, Huizi Li, Jiangong Cheng,\* Xiang Ma\* and Yanyan Fu\*



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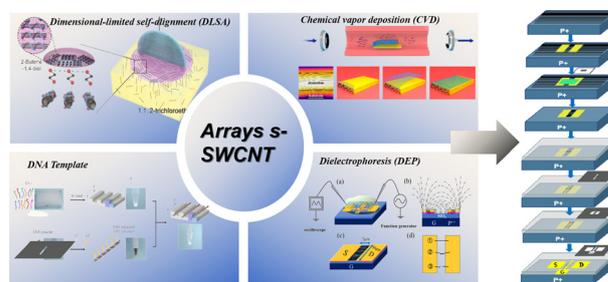
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## REVIEWS

4304

### Progress in the fabrication of high-purity semiconducting carbon nanotube arrays

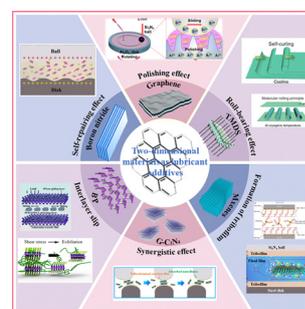
Jiaxiang Xu, Zhibo Xiao, Chunmin Jia, Yuxiang Wei, Yanan Sun, Liqian Kang, Nuanyang Cui, Peixian Li, Yimin Lei\* and Xiaohua Ma\*



4327

### Two-dimensional nanomaterials as lubricant additives: the state-of-the-art and future prospects

Zhengquan Jiang,\* Jiahao Wu, Laigui Yu, Jinglei Bi, Yadong Wang, Xiaoyi Hu, Yujuan Zhang and Weihua Li\*

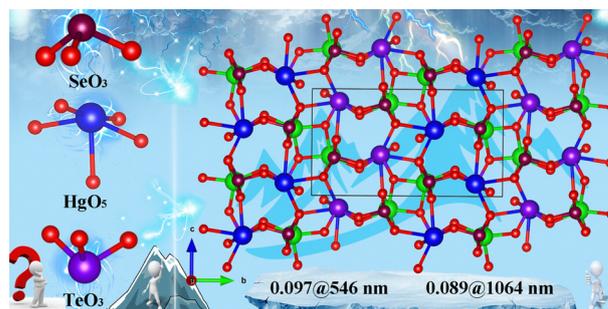


## COMMUNICATIONS

4374

### Hg<sub>2</sub>(SeO<sub>3</sub>)(TeO<sub>3</sub>): a novel tellurite–selenite birefringent crystal achieved by assembling multiple functional groups

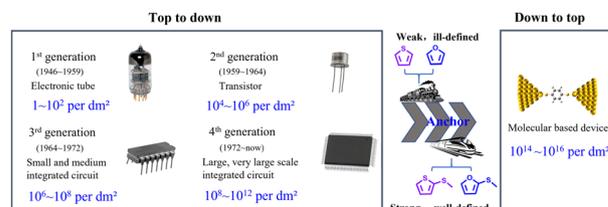
Peng-Fei Li, Chun-Li Hu, Jiang-Gao Mao and Fang Kong\*



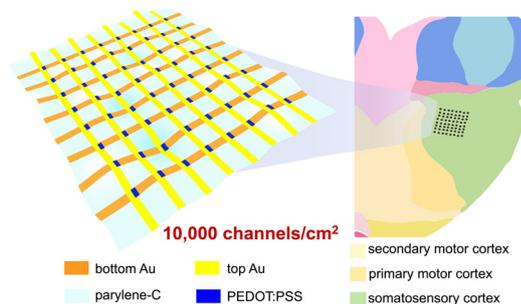
4379

### The binding details of a 2-(methylthio)thiophene/furan anchor anchored to the Au electrode in the formed molecular junction

Mengxiao Li, Aoxing Sun, Mingzhen Wang, Xu Wang, Yuhua Lu, Lei Yu\* and Yunchuan Li\*



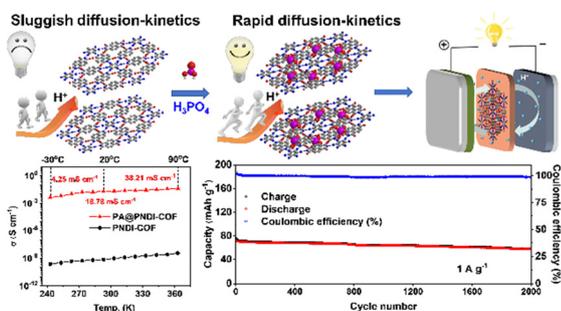
4385



### High-density, ultraflexible organic electrochemical transistor array for brain activity mapping

Wei Xu, Yanlan Zhu, Xiaolin Zhou, Haoyue Guo, Jingxin Wang, Ruiqi Zhu, Zhengwei Hu, Wei Ma, Xing Ma, Xiaojian Li and Xiaomin Xu\*

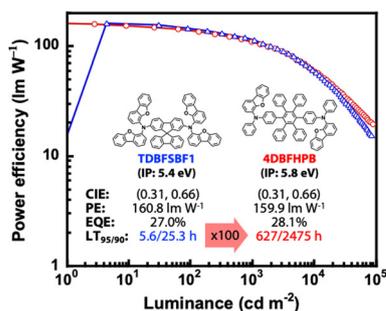
4398



### Acidified naphthalene diimide covalent organic frameworks with superior proton conduction for solid-state proton batteries

Lin-Lin Wang, Xiao-Qin Ni, Ya-Juan Han, Jin Zhang, Hong-Bin Luo, Qiao Qiao,\* Yu-Ping Wu and Xiao-Ming Ren\*

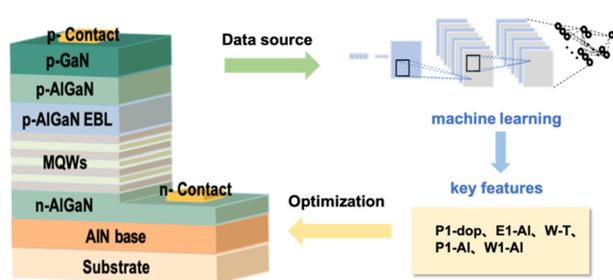
4405



### Critical importance of the hole-transporter and emission layer interface for prolonging lifetime in a phosphor-sensitized hyper-OLED based on an MR-TADF emitter

Yuma Kori, Haruki Nemma, Jiang Dehao, Naoki Meguro, Ryunosuke Mimura, Junji Kido and Hisahiro Sasabe\*

4413



### A study on device physics of deep ultraviolet light emitting diodes leveraging machine learning

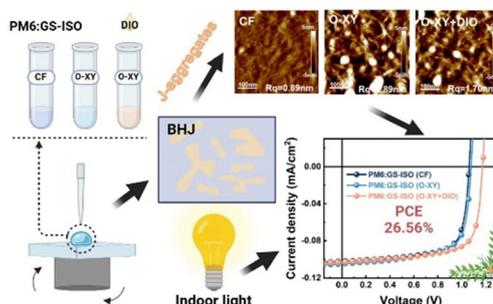
Na Lin, Zhiqiang Liu, Zhuoying Jiang, Ying Jiang, Shanshan Zhao, Jinjian Yan, Sijie Jiang, Yikai Yun, Wenjie Wei, Shaoqun Li, Ziang Wan, Jianfeng Du, Jinchai Li, Tao Tao, Kai Huang,\* Lin Li,\* Mengyu Chen,\* Cheng Li\* and Rong Zhang



4421

### Enhancing efficiency in organic electronics via J-aggregation modulation with non-halogenated solvents

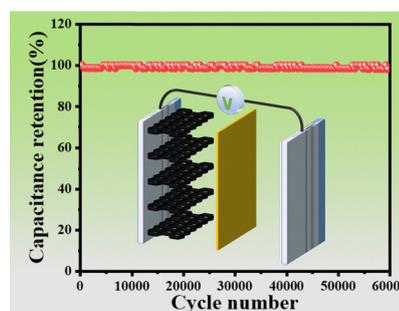
Guangting Cai, Zhenmin Zhao,\* Sein Chung, Liang Bai, Lixing Tan, Xin Li, Jingjing Zhao, Yuan Liu, Kilwon Cho and Zhipeng Kan



4429

### Extremely durable supercapacitor enabled by disordered porous carbon with a capacity retention up to 60 000 cycles

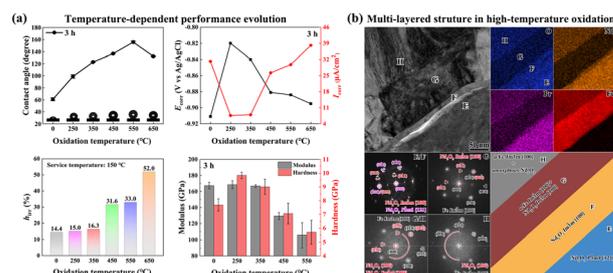
Yu Ma, Chenmiao Ma, Jingya Wang, Xiaoqing Gao, Zepeng Li\* and Yingdong Han\*



4435

### Revealing the surface oxidation mechanism and performance evolution of Nd–Fe–B sintered magnets

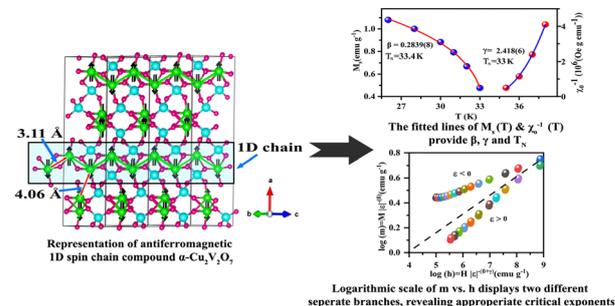
Liang Zhou, Jiaying Jin,\* Wang Chen, Shaoqing Ren, Mengfan Bu, Xu Li, Bo Xin, Chen Wu and Mi Yan\*



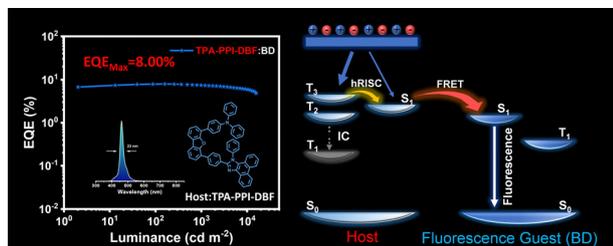
4451

### Revealing the one-dimensional (1-D) Heisenberg antiferromagnetic state in pyrochlore $\alpha$ -Cu<sub>2</sub>V<sub>2</sub>O<sub>7</sub> from critical exponent analysis

Ajith Nix ESR, Pujalin Biswal, W. Prellier, D. Samal\* and Bhaskar Chandra Behera\*



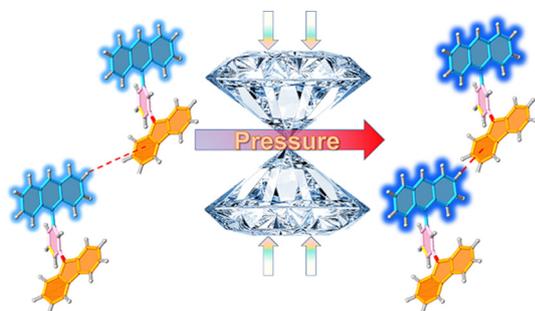
4461



### Synthesis of phenanthroimidazole-based host materials with balanced hole–electron transport for highly efficient blue fluorescent OLEDs

Zhiqiang Wang, Bohua Zhang, Yi Chen, Jiangxue Pei, Qingyu Jia, Chaobo Hao, Xiping Lei\* and Dongdong Wang\*

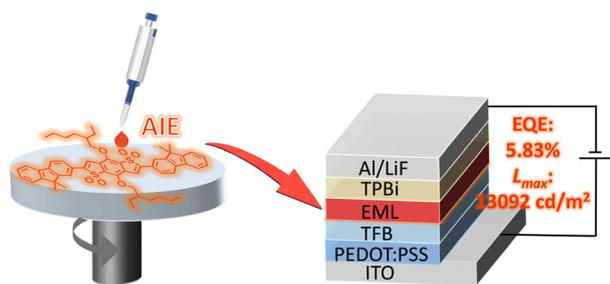
4472



### Strengthening C–H... $\pi$ intermolecular interactions induces emission enhancement of anthracene derivatives under high pressure

Yonghui Lv, Xinqi Yang, Wenpeng Jia, Qian Li, Wengang Liu, Ben-guo He, Yongli Liu, Kai Wang,\* Haichao Liu\* and Yuxiang Dai\*

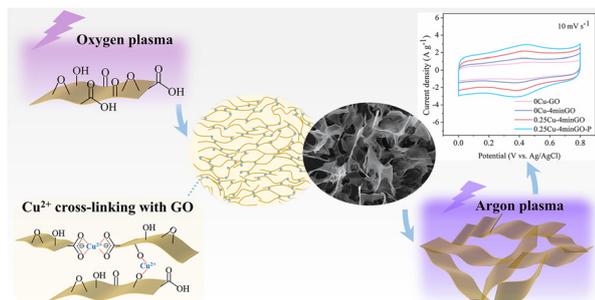
4480



### Red/deep-red fluorophores based on benzo[1,2-*b*:4,5-*b'*]dithiophene 1,1,5,5-tetraoxide for high-performance solution-processed OLEDs

Zixuan Zhang, Zifan Yu, Meijing Li\* and Shijie Zhen\*

4488



### Improved electrochemical performance of graphene oxide *via* copper ion cross-linking and plasma functionalization

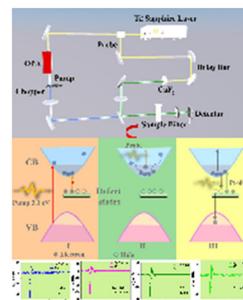
Wenqi Zhao, Minghui Cui, Yansong Zhou, Yanjing Liu, Qiongrong Ou\* and Shuyu Zhang\*



4499

## Broadband nonlinear optical response and ultrafast carrier dynamics in defect-engineered Fe–Co<sub>3</sub>O<sub>4</sub> for photonics

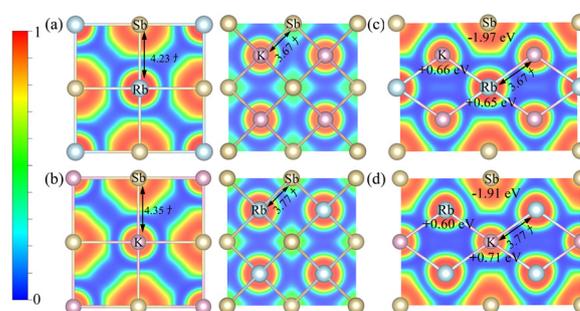
Linghao Kong, Hongwei Chu,\* Zhongben Pan, Han Pan, Shengzhi Zhao and Dechun Li\*



4511

## Unveiling the microscopic origins and thermoelectric performance of full-Heusler compounds K<sub>2</sub>RbSb and Rb<sub>2</sub>KSb

Peipei Liu, Yinchang Zhao,\* Jun Ni and Zhenhong Dai\*



4523

## Suppressing efficiency roll-off of orange-red thermally activated delayed fluorescence polymer-based OLEDs via copolymerizing co-hosts with cascade energy levels

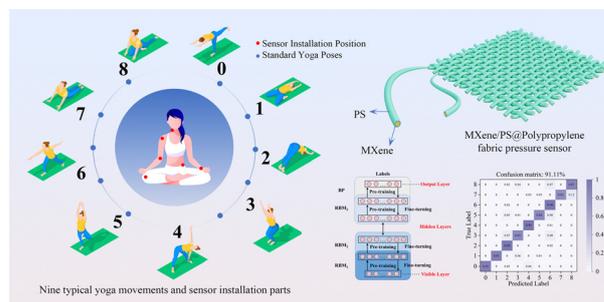
Mati Ullah Khan, Lei Hua,\* Yuchao Liu, Haisong Zhao, Yumeng Guo, Yafei Wang, Shouke Yan\* and Zhongjie Ren\*



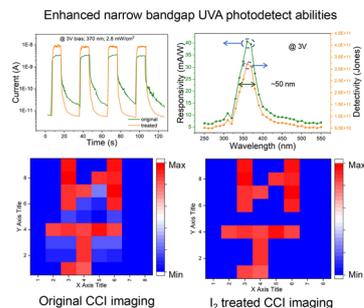
4533

## Highly hydrophobic MXene/PS@polypropylene fabric for human posture recognition assisted by machine learning

Daihui Zhang, Chunqing Yang, Jun Wang, Yukun Liu, Jiahui Shao and Dongzhi Zhang\*



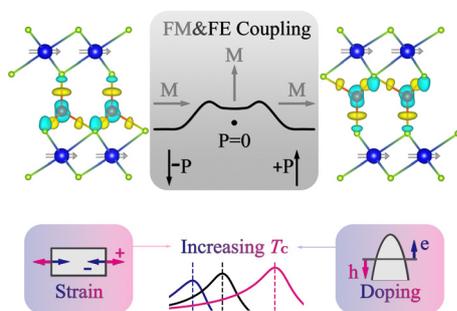
4543



### Recrystallization of single crystal $\text{CsCu}_2\text{I}_3$ perovskites by $\text{I}_2$ treatment for enhanced UV detecting abilities

Fa Cao,\* Guanyu Cheng, Enliu Hong, Ying Liu, Sancang Han, Pingping Yu\* and Bin Sun\*

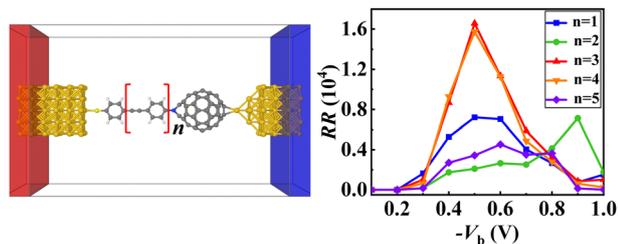
4549



### Multiferroic metallic monolayer $\text{Cu}(\text{CrSe}_2)_2$

Ke Yang, Yuxuan Zhou, Yaozhenghang Ma and Hua Wu\*

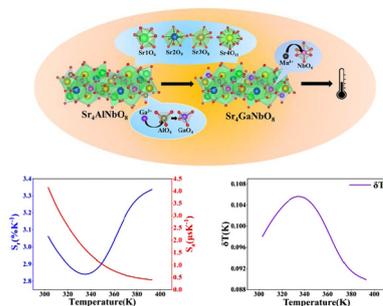
4557



### Fullerene-based single molecule diodes with huge rectification ratios: a DFT-NEGf study

Minjing Zhang, Zhaodi Yang, Si-Dian Li\* and Yuewen Mu\*

4564



### $\text{Sr}_4\text{GaNbO}_8:\text{Mn}^{4+}$ : a novel perovskite-structured red-emitting phosphor for a luminescence lifetime thermometer with good relative sensitivity and repeatability

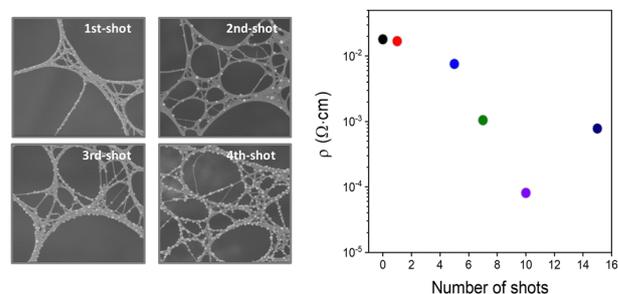
Zhenyu Huang, Kai Li,\* Zhiyu Zhang, Jianing Liu and Daiman Zhu\*



4576

### Photo-thermally controlled Cu nanoparticles density in SWCNT/Cu nanocomposites-based flexible EMI shielding electrodes

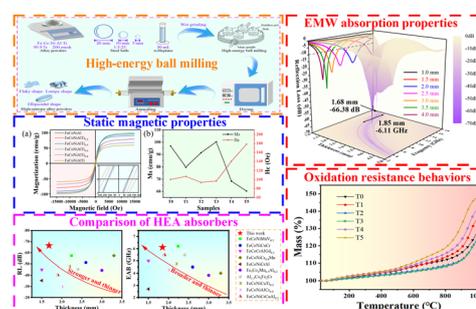
Jae-Won Lee, Juhee Kim, Min Su Kim, Kyong-Soo Hong, Imjeong H.-S. Yang\* and Hee Jin Jeong\*



4583

### Excellent electromagnetic wave absorption performances of FeCoNiAlTi<sub>x</sub> high-entropy alloys with superior oxidation resistance

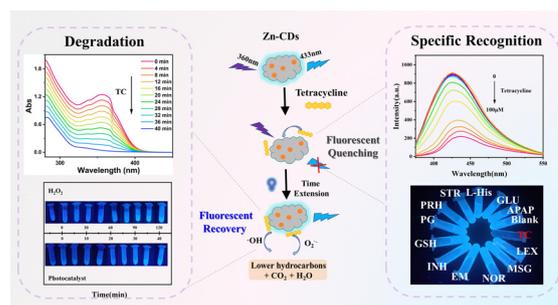
Yansi Wang, Liyang Fang, Chenran Xu, Xiaoling Chen, Zhiyou Lu, Guanglong Xu, Lingwei Yang, Yifang Ouyang and Xiaoma Tao\*



4594

### Multifunctional Zn-carbon dots enhanced specific recognition and *in situ* degradation of tetracycline

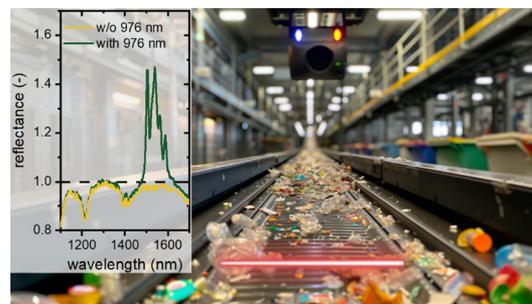
Tianbao Liu, Weixuan Zhao, Shenhua Meng, Biao Dong, Nan Shi\* and Weiguang Shi\*



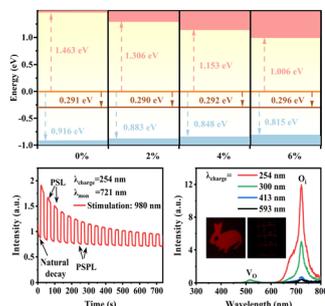
4605

### Optimizing the short-wavelength infrared photoluminescence quantum yield and brightness of Er<sup>3+</sup>, Yb<sup>3+</sup> co-doped yttrium orthophosphate phosphors for tracer-based sorting

Nisrin Mohamed Bhiri, Herman Duim, Eduard Madirov, Justine Nyarige, Bryce S. Richards\* and Andrey Turshatov\*



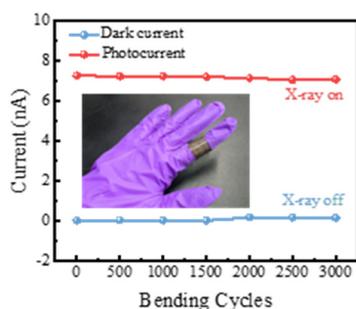
4616



### The self-activated LiGa<sub>5</sub>O<sub>8</sub> storage phosphor: insights into its photo/thermo/mechano-stimulated NIR luminescence

Min Jia, Xiangyu Zhang,\* Xue Yang, Zehao Lin, Dingjun Jia, Yuqiang Wang, Sining Yun and Dangli Gao\*

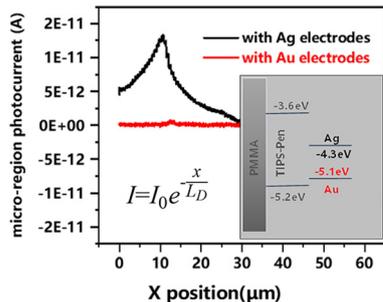
4626



### Lead-free metal halides for a stable, flexible, and high-performance X-ray detector

Juan Zhao, Youkui Xu, Guoqiang Peng, Yujiang Wu, Qian Wang\* and Zhiwen Jin

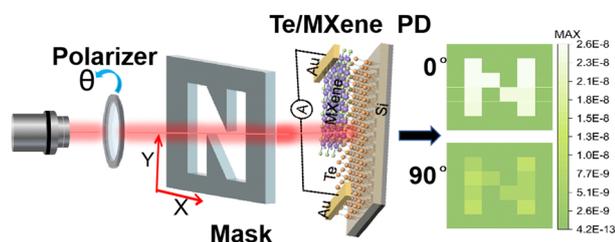
4634



### How far can a minority charge carrier of an organic semiconductor walk? An *in situ* observation by scanning photocurrent microscopy

Di Sun, Xuehua Hou, Yonglin Cao, Hui Chai, Zengqi Xie and Linlin Liu\*

4642



### A 2D Te/Mxene Schottky junction for a self-powered broadband photodetector with high polarization-sensitive imaging

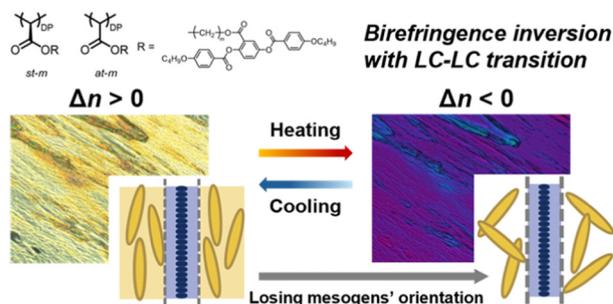
Pingping Yu, Yuqing Kong, Xiaotian Yu, Xi Wan, Fa Cao\* and Yanfeng Jiang\*



4651

### Birefringence inversion in liquid crystalline poly(substituted methylene)s bearing side-on mesogens

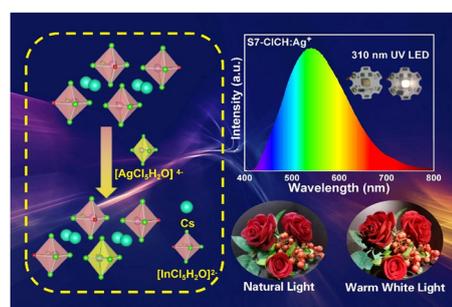
Masamichi Kiyoura, Hiroyuki Kudo, Keiki Inoue, Fumitaka Ishiwari, Takanori Fukushima, Naruki Kurokawa and Masatoshi Tokita\*



4658

### Broadband and warm white emission in $\text{Cs}_2\text{In}_{1-x}\text{Cl}_5 \cdot \text{H}_2\text{O} : x\text{Ag}^+$ phosphors enabled by $\text{H}_3\text{PO}_2$ -mediated stabilization

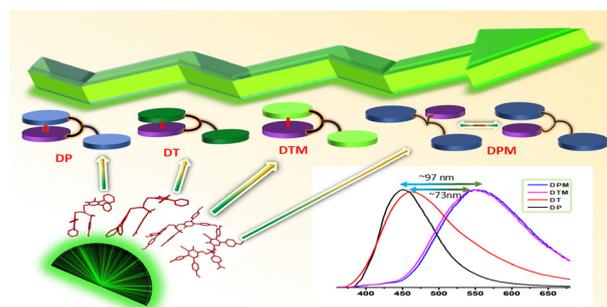
Ying Qin, Yuexiao Pan,\* Haoshuai Wang, Tiantian Zhao, Weiyu Xu, Qian Miao\* and Jun Zou\*



4665

### Designing symmetrically folded scaffolds of pyridazinone and triazinone derivatives linked via *N,N*-diethyl-4-nitro-benzenesulfonamide to explore luminescent materials

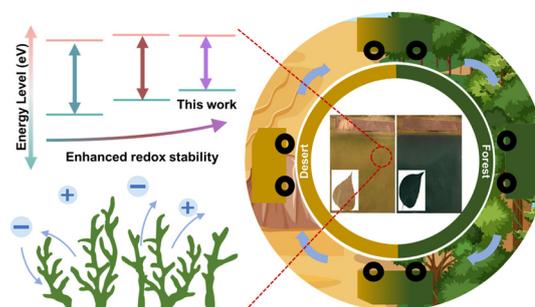
Vipin Kumar, Krishanu Bandyopadhyay, Manisha Nidhar, Vishal Prasad Sharma, Priyanka Yadav, Suman Gill, Priyanka Sonker, Abhineet Verma, Satyen Saha\* and Ashish Kumar Tewari\*



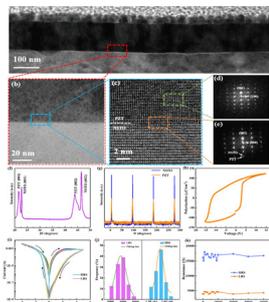
4673

### Electrochromic fabrics with improved cycling stability via modified polyaniline towards environmentally adaptive camouflage

Mingyu Ding, Wanzhong Li, Ang Li, Yuhao Wang, Jingbing Liu, Qianqian Zhang\* and Hao Wang\*



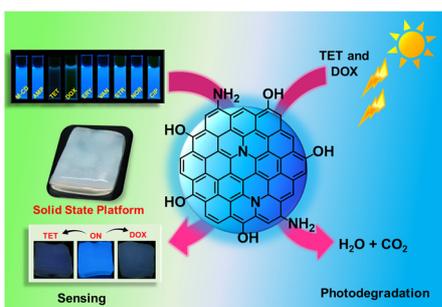
4683



### Photoelectric memristor based on a PZT/NSTO heterojunction for neuromorphic computing applications

Jingjuan Wang, Zhaowen Wang, Wenze Zhao and Xiaobing Yan\*

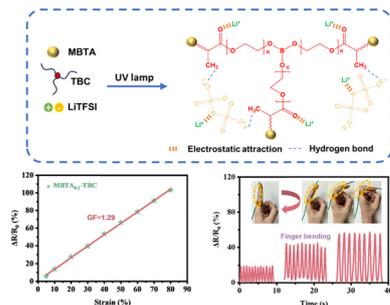
4691



### A carbon dot anchored bacterial cellulose hybrid platform as a fluorescent sensor and photocatalytic remover of pharmaceuticals

Nirmiti Mate, Kallayi Nabeela and Shaikh M. Mobin\*

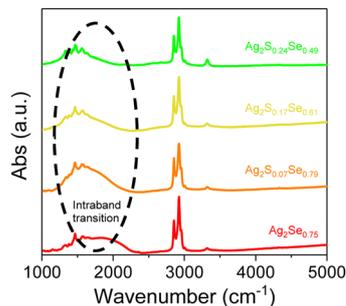
4702



### Highly linear wearable ionic gel based on self-assembled discoid liquid crystal towards human motion monitoring

Jie Chen, Rui Feng,\* Peng Su, Tong Zhou and Lijie Dong\*

4709



### Tailoring intraband transition via composition in self-doped $\text{Ag}_2\text{S}_x\text{Se}_y$ alloy nanocrystals

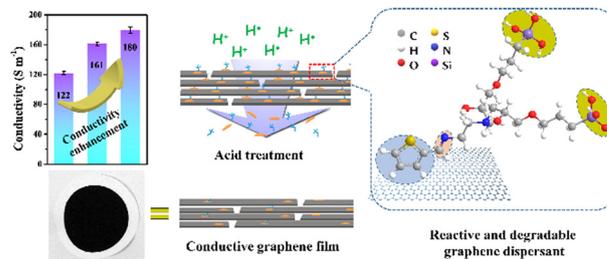
Youngjo Choi, Haemin Song, Gyu Ho Song, Hee Kwon Kim, Yoon Seo Jung, Hyeong Seok Kang, Woong Kim\* and Kwang Seob Jeong\*



4716

## Reactive and decomposable dispersant for maximizing the properties of graphene composites

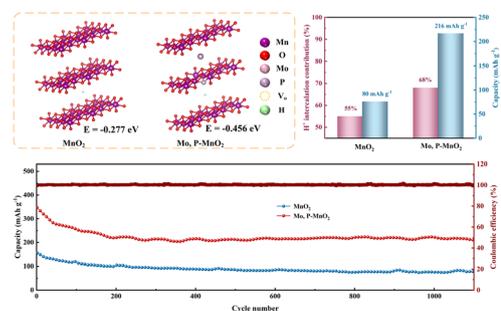
Junshuo Cui,\* Xuening Du, Shiyi Liu, Liangyu Guo, Wanqi Liu and Ying Xiong\*



4727

## Unlocking Mo, P co-doping to boost proton intercalation in MnO<sub>2</sub> as a high-performance cathode material for aqueous zinc-ion batteries

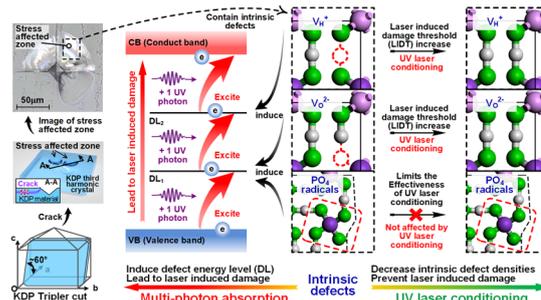
Kaixuan Ma, Guangfeng Liang, Qingze Jiao, Haibo Jin, Yuefeng Su, Ning Li, Jingbo Li, Zhiyong Xiong, Caihong Feng\* and Yun Zhao\*



4737

## Evolution of intrinsic defect density in UV laser conditioning at the KDP crystal stress affected zone and its role in improving the laser induced damage threshold

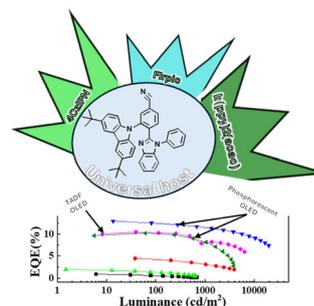
Jianrui Hu, Zhaoyang Yin, Jian Cheng,\* Jixiang Chen, Linjie Zhao, Hongqin Lei, Guang Chen and Mingjun Chen



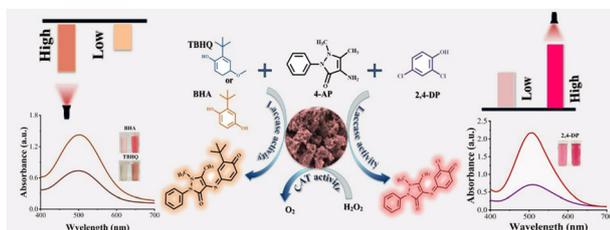
4749

## The effect of bipolar charge transport of derivatives of 1-phenyl-1*H*-benzo[*d*]imidazole with horizontal molecular orientation on the performance of OLEDs based on thermally activated delayed fluorescence or phosphorescence

Simas Macionis, Ehsan Ullah Rashid, Jurate Simokaitiene, Rita Butkute, Oleksandr Bezikonnyi, Dmytro Volyniuk, Dalius Gudeika, Tien-Lung Chiu, Jiun-Haw Lee, Zi-Wen Su, Chia-Hsun Chen, Ruta Budreckiene, Mariia Stanitska, Oleksandr Navozenko and Juozas V. Grazulevicius\*



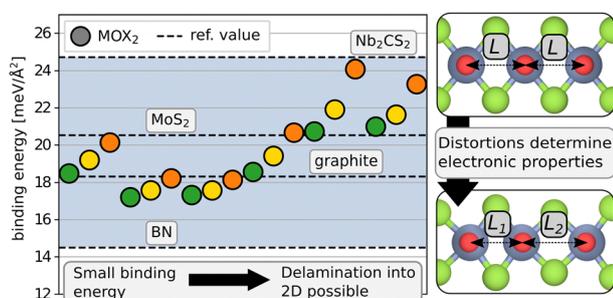
4760



### Cu-MOF/C<sub>3</sub>N<sub>5</sub> as a laccase-like nanozyme for colorimetric detection of antioxidants in electronic cigarettes

Ya Ruan, Zheng Chen, Xianfang Rong, Qianqian Pang, Dezhi Yang, Yaling Yang\* and Zhichao Chen\*

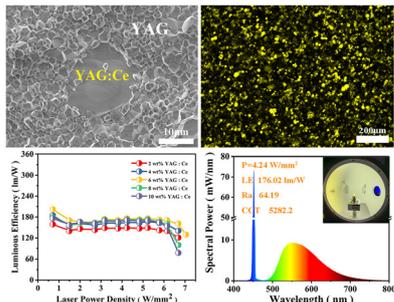
4769



### Computational screening of MOX<sub>2</sub> transition metal oxydihalides with M = V, Nb, Ta, Mo, Ru, or Os, and X = Cl, Br, or I

Pernilla Helmer, Martin Dahlqvist and Johanna Rosen\*

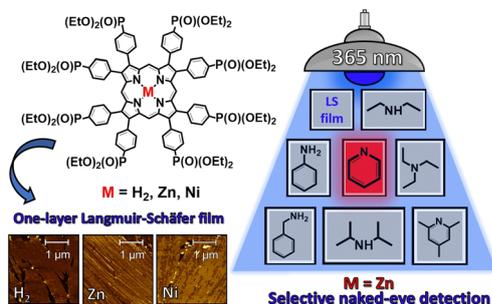
4781



### Reactive spark plasma sintering of YAG–YAG:Ce composite phosphor ceramics for laser-driven lighting with high luminous efficacy

Hailiang Fang, Lei Li, Beiyong Zhou,\* Weijie Li, Shijia Gu, Qi Zheng, Lianjun Wang\* and Wan Jiang\*

4791



### Supramolecular assembly of phosphonate-substituted porphyrins in Langmuir layers and Langmuir–Schäfer films: structural studies and selective sensing of pyridine vapors

Elizaveta V. Ermakova,\* Vladimir V. Arslanov, Yann Bretonnière, Carine Michel and Alla Bessmertnykh-Lemeune\*

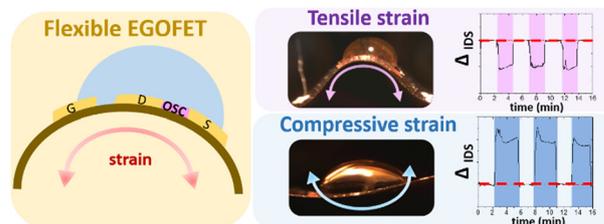


## PAPERS

4807

### Influence of mechanical stress on flexible electrolyte-gated organic field-effect transistors

Sara Ruiz-Molina, Simona Ricci, Carme Martínez-Domingo, María Jesús Ortiz-Aguayo, Raphael Pfattner, Guillaume Schweicher, Yves H. Geerts, Tommaso Salzillo and Marta Mas-Torrent\*



## CORRECTION

4816

### Correction: Recent developments in emerging two-dimensional materials and their applications

Karim Khan,\* Ayesha Khan Tareen,\* Muhammad Aslam, Renheng Wang, Yupeng Zhang, Asif Mahmood, Zhengbiao Ouyang,\* Han Zhang\* and Zhongyi Guo\*

