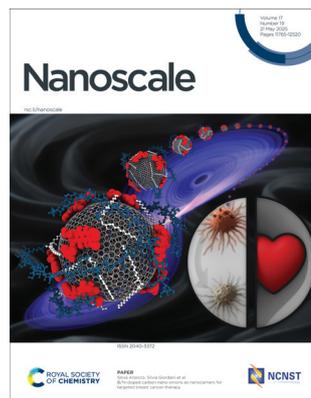


## IN THIS ISSUE

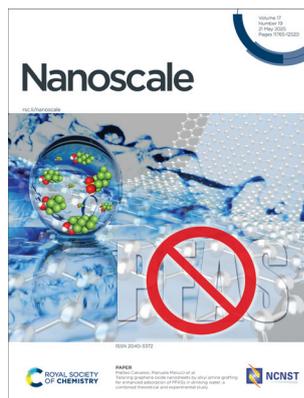
ISSN 2040-3372 CODEN NANOHL 17(19) 11765–12520 (2025)



### Cover

See Silvia Arpicco, Silvia Giordani *et al.*, pp. 12108–12123.

Image reproduced by permission of Silvia Giordani from *Nanoscale*, 2025, **17**, 12108.



### Inside cover

See Matteo Calvaresi, Manuela Melucci *et al.*, pp. 12124–12133.

Image reproduced by permission of Manuela Melucci from *Nanoscale*, 2025, **17**, 12124.

## EDITORIAL

11781

### Introduction to MXene chemistries in biology, medicine and sensing

Maksym Pogorielov,\* Açelya Yilmazer,\* Lucia Gemma Delogu\* and Yury Gogotsi\*

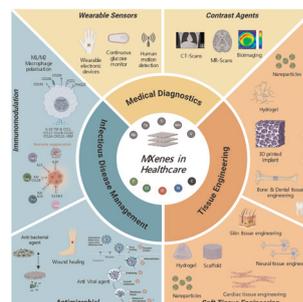


## REVIEWS

11785

### MXenes in healthcare: transformative applications and challenges in medical diagnostics and therapeutics

Keshav Narayan Alagarsamy, Leena Regi Saleth, Kateryna Diedkova, Veronika Zahorodna, Oleksiy Gogotsi, Maksym Pogorielov and Sanjiv Dhingra\*



# RSC Applied Interfaces

GOLD  
OPEN  
ACCESS

Interfacial and surface research  
with an applied focus

Interdisciplinary and open access

[rsc.li/RSCApplInter](https://rsc.li/RSCApplInter)

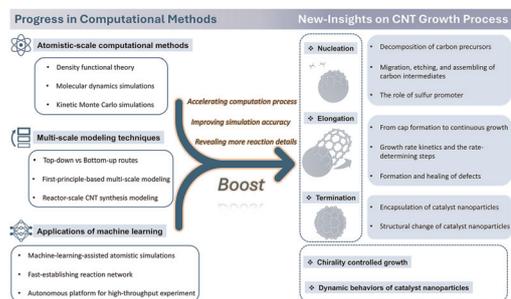
Fundamental questions  
Elemental answers

## REVIEWS

11812

## Progress in computational methods and mechanistic insights on the growth of carbon nanotubes

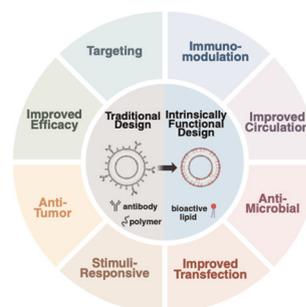
Linzheng Wang,\* Nicolas Tricard, Zituo Chen and Sili Deng\*



11864

## More than a delivery system: the evolving role of lipid-based nanoparticles

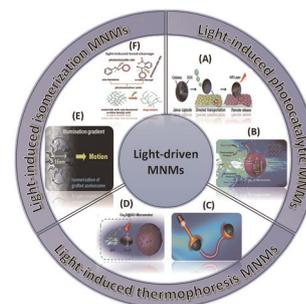
Senjuti Karmaker, Plinio D. Rosales, Barath Tirumuruhan, Amartya Viravalli and Natalie Boehnke\*



11894

## Material selection, preparation, driving and applications of light-driven micro/nano motors: a review

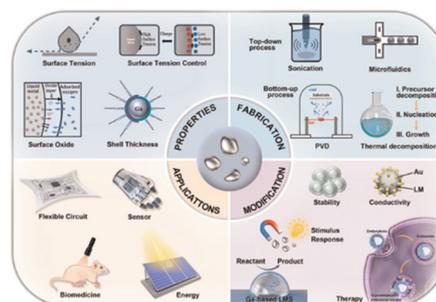
Lingcong He, Tao He, Yonghui Yang and Xue-Bo Chen\*



11934

## Recent advances for core-shell gallium-based liquid metal particles: properties, fabrication, modification, and applications

Huihui Tian, Jinyun Liu,\* Wuxu Zhang, Zhaopeng Liu, Hao Liu, Xingyu Zhu, Zhongqi Liu, Jiawei Wu, Baoru Bian, Yuanzhao Wu, Yiwei Liu, Jie Shang\* and Run-Wei Li\*



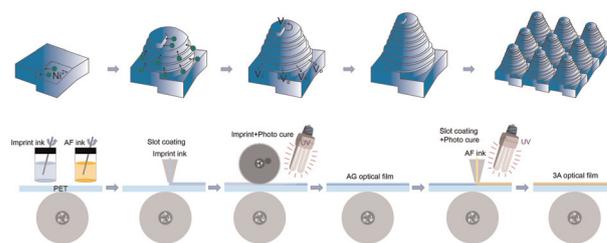


## COMMUNICATIONS

12072

## Fabricating 3A optical films via transfer printing from a nickel nanocone array template

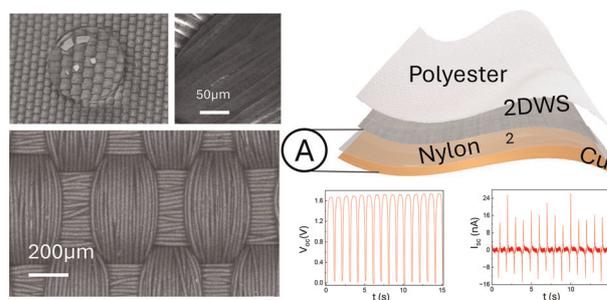
Kun Gan, Shanlin Li, Haojie Zhu, Weisheng Pan, Rui Yao and Cheng Yang\*



12080

Integration of two-dimensional WS<sub>2</sub> in flexible textile triboelectric nanogenerators via electronic dyeing for self-powered sensing

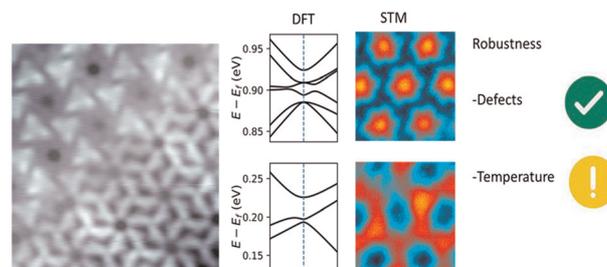
Mashaal H. Albuqami, Evgeniya Kovalska, Kavya S. Sadanandan, Mashaal S. Alghamdi, Ana I. S. Neves, Saverio Russo and Monica F. Craciun\*



12087

## Evidence of Au(111) topological states in a kagome analogue lattice and their robustness beyond ultra-low temperatures and defect-free conditions

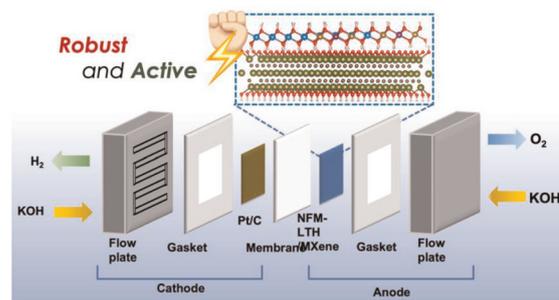
Dave Austin, Ana Barragán, Eric D. Switzer, Sara Lois, Ane Sarasola, Duy Le,\* Talat S. Rahman and Lucia Vitali\*



12094

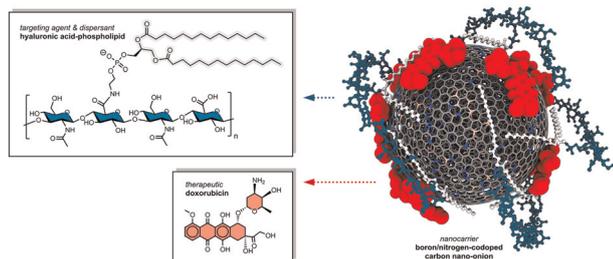
## NiFeMo layered triple hydroxide and MXene heterostructure for boosted oxygen evolution reaction in anion exchange membrane water electrolysis

Santanu Pal, Ekta Chaturvedi, Chandni Das, Nibedita Sinha, Tanbir Ahmed and Poulomi Roy\*



## PAPERS

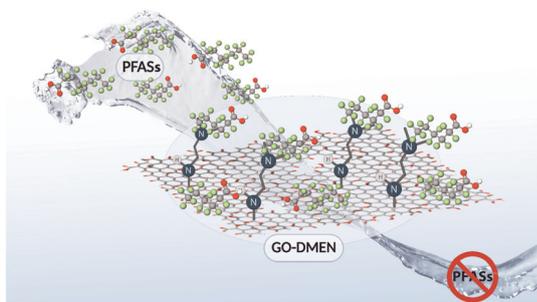
12108



### B/N-doped carbon nano-onions as nanocarriers for targeted breast cancer therapy

Hugh Mohan, Iris Chiara Salaroglio, Michał Bartkowski, Kellyjean Courtney, Ilaria Andreana, Tania Limongi, Raul Arenal, Chiara Riganti, Silvia Arpicco\* and Silvia Giordani\*

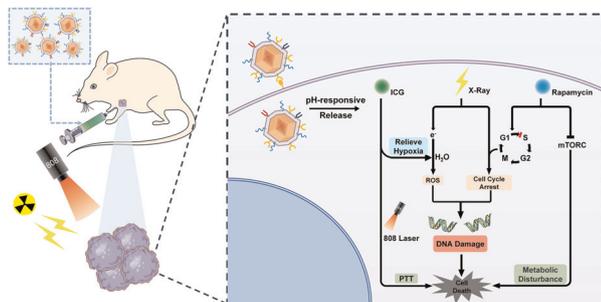
12124



### Tailoring graphene oxide nanosheets by alkyl amine grafting for enhanced adsorption of PFASs in drinking water: a combined theoretical and experimental study

Andrea Trifoglio, Sebastiano Mantovani, Sara Khaliha, Alessandro Kovtun, Tainah Dorina Marforio, Matteo Calvaresi\* and Manuela Melucci\*

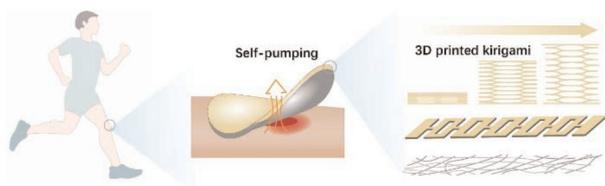
12134



### A ZIF-8-based dual-modal smart responsive nanoplatfor for overcoming radiotherapy resistance in advanced tumors

Yi Feng, Zijing Li, Luqi Song, Shu Zhang, Bin Chen, Guanglin Wang, Kai Yang, Yan Lu\* and Ran Zhu\*

12149



### 3D-printed kirigami-inspired asymmetric dressings: custom elasticity and self-pumping for enhanced wound healing

Zhen Gu,\* Siyang Cheng, Zhe Huang, Heng An, Liping Zhou\* and Yongqiang Wen\*

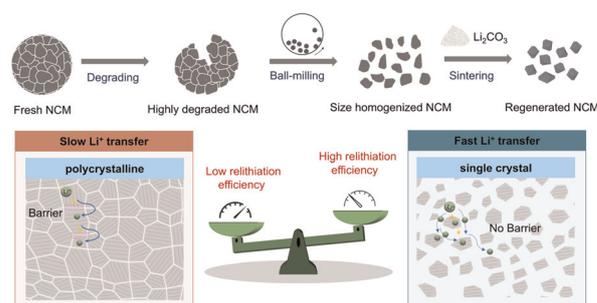


## PAPERS

12162

**Homogenization enabled efficient regeneration of spent Ni-rich  $\text{LiNi}_x\text{Co}_y\text{Mn}_{1-x-y}\text{O}_2$  cathodes**

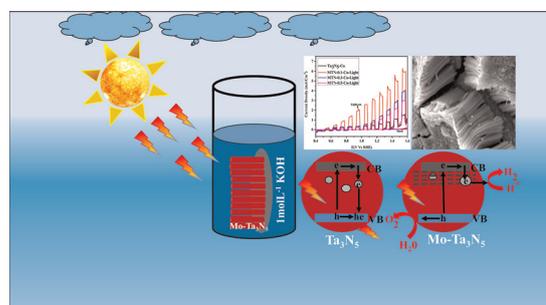
Xiangjun Liu, Penglei Yan, Binglei Jiao,\* Guiling Wang, Chunling Zhu, Qiao Zhang, Jinxing Chen and Panpan Xu\*



12172

**Substitutional Mo doping in a  $\text{Ta}_3\text{N}_5$  photoanode: mitigating native defects through engineering and enhancing water-splitting performance**

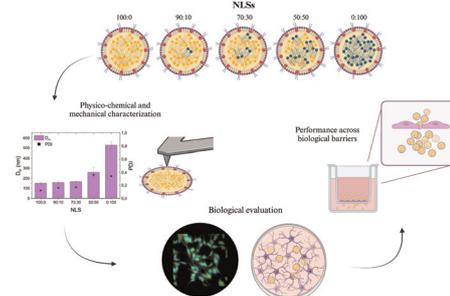
Hameed Ullah,\* Altaf Ur Rahman, Ariadne Koche, Carlos F. O. Graeff, Marcus V. Castegnaro, Marcos Jose leite Santos and Sherdil Khan\*



12187

**Tuning lipid nanocarrier mechanical properties to improve glioblastoma targeting and blood barrier penetration**

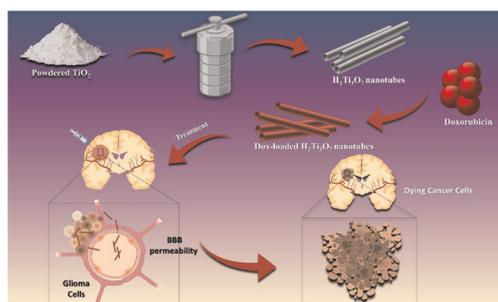
Ana Robles-Fernández, Daniel Jiménez-Boland, Alberto Leon-Cecilla, Martín Villegas-Montoya, José Ángel Traverso, Miguel A. Cuadros, Antonio Martín-Rodríguez, Modesto T. Lopez-Lopez, Mattia Bramini,\* Carmen Lucía Moraila-Martínez\* and Paola Sánchez-Moreno\*



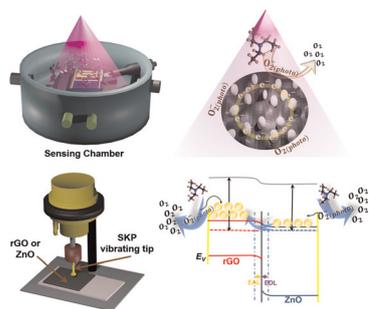
12204

**Engineering biocompatible hydrogen titanate nanocarriers with blood brain barrier (BBB) crossing potential for doxorubicin delivery to glioma cells**

Samraggi Choudhury, Ghrutanjali Sahu, Pankaj Kharra, Himanshu Sekhar Panda, Laxmidhar Besra, Sriparna Chatterjee\* and Jiban Jyoti Panda\*



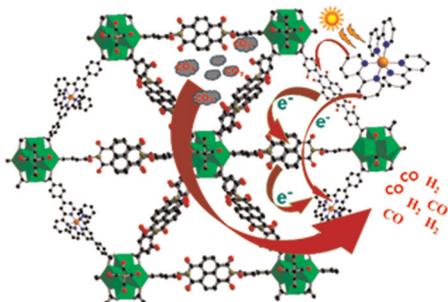
12220



### Reduced graphene oxide/ZnO nanocomposites: one-step solid-state preparation for room temperature photo-sensing and photoelectrical gas sensing capabilities

Nileshkumar M. Pardeshi, Rahul S. Ghuge, Priyanka N. Birla, Mohan Nagarajan, Manish D. Shinde,\* Yuvaraj Sivalingam,\* Rajendra D. Kale\* and Sunit B. Rane

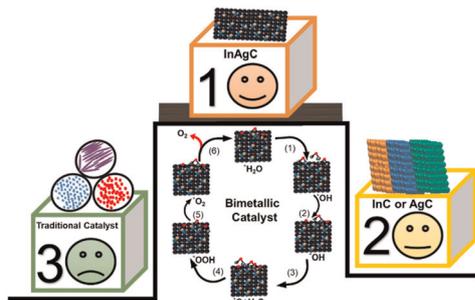
12235



### A molecularly engineered MOF photocatalyst for CO production from visible light-driven CO<sub>2</sub> reduction

Anupam Jana, Arijit Maity, Ashadul Adalder, Sinthia Saha and Asamanjoy Bhunia\*

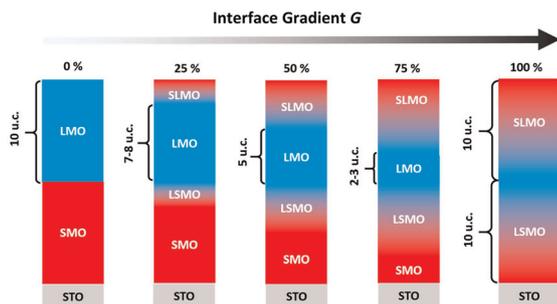
12245



### Innovative InAg-carbon nanocomposites: mesoporous design for OER enhancement

Sandhyawasini Kumari, Somnath C. Dhawale, Afaq Ahmad Khan,\* Hanumant B. Kale, Bhaskar R. Sathe, Manoj B. Gawande\* and M. S. Santosh\*

12260



### Nanoscale engineering of electronic and magnetic modulations in gradient functional oxide heterostructures

Leonard Schüler, Yannik Sievers, Vladimir Roddatis, Ulrich Ross, Vasily Moshnyaga\* and Fryderyk Lyzwa\*

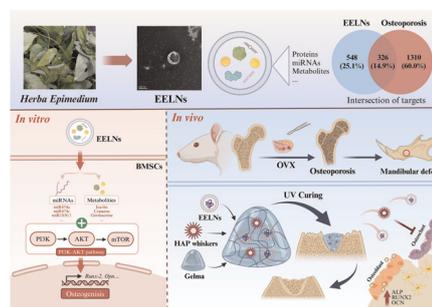


## PAPERS

12270

### A comprehensive study on *Herba Epimedii*-derived extracellular nanovesicles as a prospective therapy for alveolar bone regeneration in postmenopausal osteoporosis

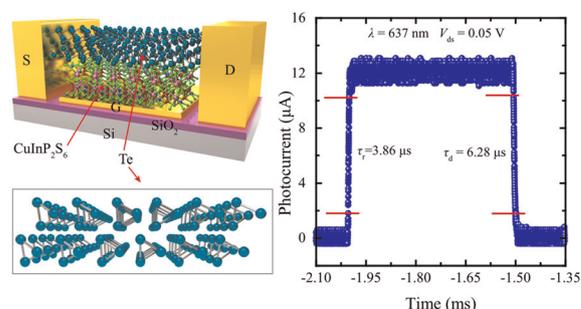
Ruiying Han, Canyu Gao, Rong Tang, Xingyu Gui, Wanxi Chen, Jiarun Fu, Tianyi Wang, Ding Bai,\* Yongwen Guo\* and Changchun Zhou\*



12290

### Broadband photoresponse based on a Te/CuInP<sub>2</sub>S<sub>6</sub> ferroelectric field-effect transistor

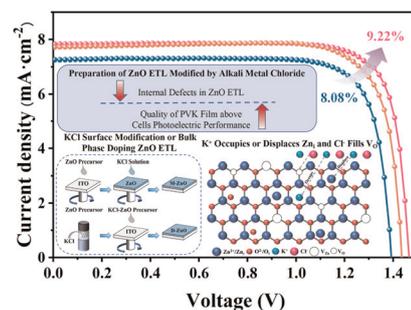
YaJie Bai, Dongliang Shan, Huixian Li, Yuhao Ye, Suofu Wang, Tao Han, Wenhui Wang, Feng Li, Yunya Liu,\* Lei Shan\* and Mingsheng Long\*



12299

### Bulk and surface defect manipulation of the ZnO ETL for all-inorganic CsPbBr<sub>3</sub> perovskite solar cells

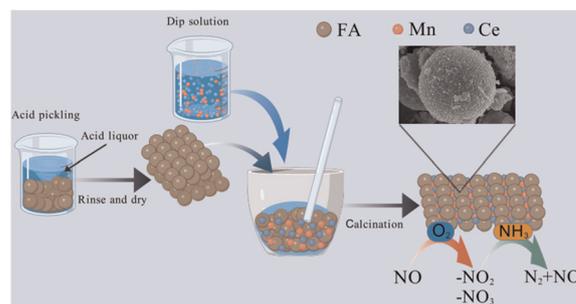
Yang Wang, Wenhao Zhu, Xuanheng Chen, Xiantao Yang, Anling Tong, Sheng Yang,\* Jihuai Wu\* and Weihai Sun\*



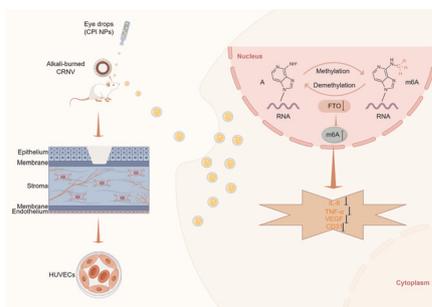
12310

### Effect of acid leaching on the denitrification efficiency of a MnCe@FA catalyst derived from fly ash: structure, crystal phase, active component interaction phase and active components

Liguo Chen, Mutao Xu, Yongzhong Wang, Qijie Jin,\* Jing Song, Changcheng Zhou, Jisai Chen, Jian Yang and Haitao Xu\*



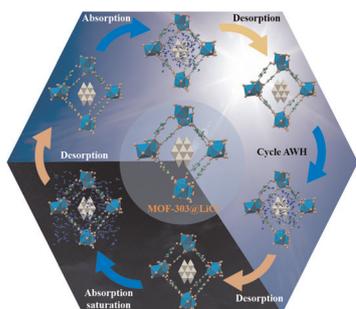
12323



### Topical application of insulin encapsulated by chitosan-modified PLGA nanoparticles to alleviate alkali burn-induced corneal neovascularization

Yuqing Zhang, Yangrui Du, Sijie Zhou, Zeqi Liu, Pan Li and Zhiyu Du\*

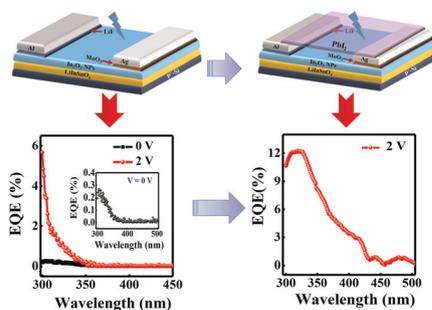
12340



### A novel hygroscopic salt-modified MOF-303 with efficient solar-driven water harvesting from arid air

Guangyi Tian, Changhui Fu and Zhiguang Guo\*

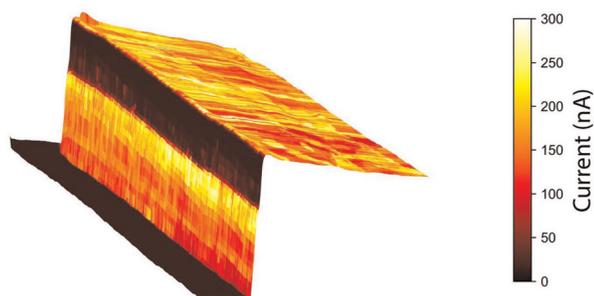
12350



### Fabrication of an In<sub>2</sub>O<sub>3</sub> NP-based high-performance low-operating voltage phototransistor and tuning of its photosensitivity from UV to blue region

Akhilesh Kumar Yadav, Utkarsh Pandey, Pijush Kanti Aich, Vishwas Acharya, Swati Suman and Bhola N. Pat\*

12361



### Electrical properties of collapsed MoS<sub>2</sub> nanotubes

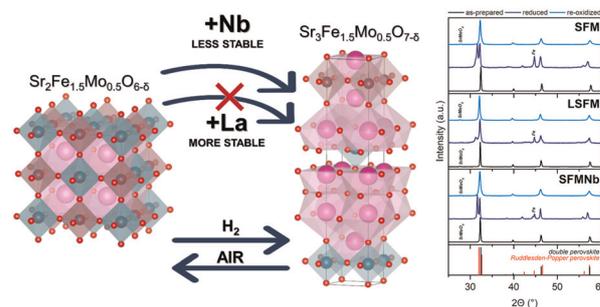
Matjaž Malok,\* Janez Jelenc and Maja Remškar



12371

### Investigation of the phase transition to the Ruddlesden–Popper phase in La- or Nb-doped $\text{Sr}_2\text{Fe}_{1.5}\text{Mo}_{0.5}\text{O}_{6-\delta}$ double perovskites and the impact of lanthanum or niobium doping

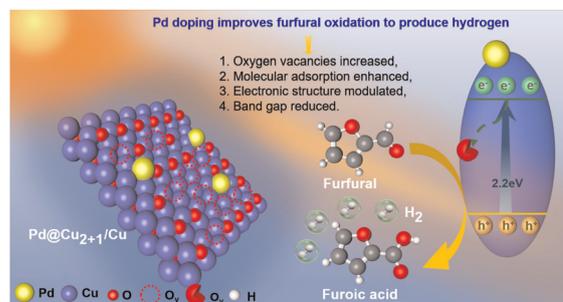
Agata Ducka,\* Patryk Błaszczak, Marcin Zając, Alexey Maximenko, Maria Gazda and Beata Bochentyn



12385

### Atomic doping and light irradiation promote anodic hydrogen evolution through furfural oxidation on $\text{Cu}_{2+1}\text{O}/\text{Cu}$ nano-dendrites

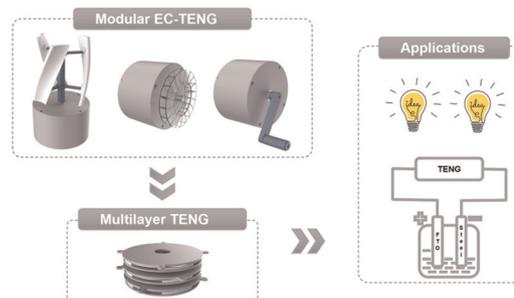
Yuan Xu, Tao He, Yechan Yin, Liqiu Zhang,\* Hongxia Shen, Bin Li, Lichun Liu\* and Song Bai\*



12396

### Design of high-performance modular triboelectric nanogenerators for efficient mechanical energy harvesting and electrochemical applications

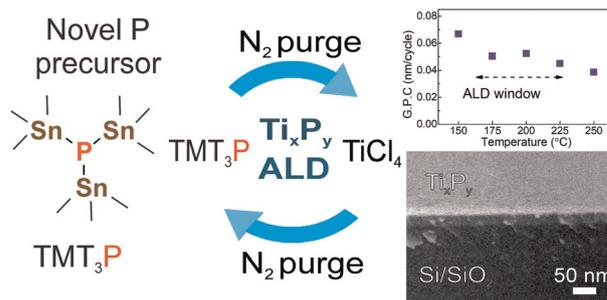
Hui Li, Ming Li, Jiwen Wang, Hongfa Han, Jiahui Liu, Weichao Wang\* and Yan Chen\*



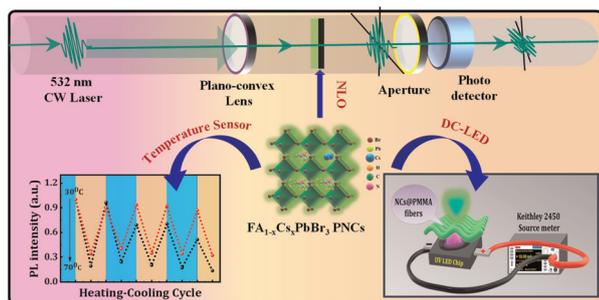
12406

### Synthesis of titanium phosphide by thermal ALD based on a novel phosphorus precursor

Raul Zazpe,\* Jaroslav Charvot, Jhonatan Rodriguez-Pereira, Luděk Hromádka, Michal Kurka, Kaushik Baishya, Hanna Sopha, Filip Bureš and Jan M. Macak



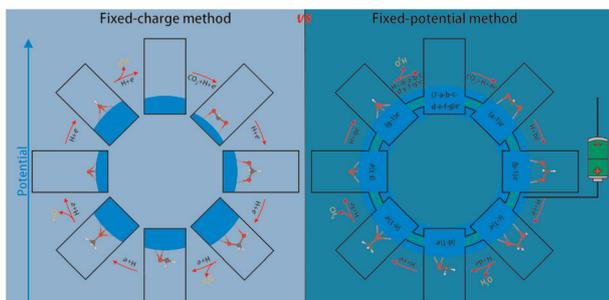
12416



### Nonlinear optical properties of stable Cs-doped FAPbBr<sub>3</sub> core@shell layered perovskite nanocrystals: superior temperature sensing and flexible fiber-based pure green LEDs

Ashutosh Mohapatra,\* Smaranika Ray, Prabhukrupa C. Kumar, Rajat Kumar Das, Pragalb Kashyap and Saikat Bhaumik\*

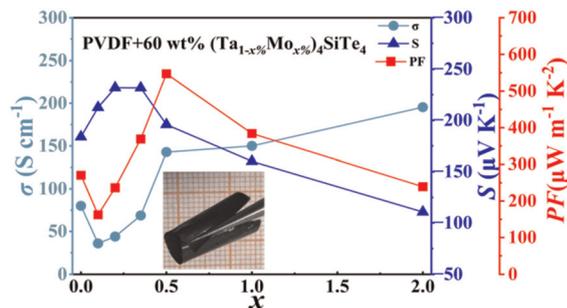
12432



### High-efficiency CO<sub>2</sub> electroreduction on molybdenene: a comparative study using fixed-charge and fixed-potential methods

Song Yu, Huajian Pan, Xinzhuo Zhou, Dongxiao Yang and Gang Bi\*

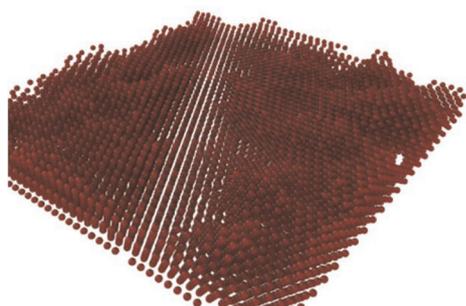
12441



### Enhanced thermoelectric performance of (Ta<sub>1-x</sub>Mo<sub>x</sub>)<sub>4</sub>SiTe<sub>4</sub>/polyvinylidene fluoride (PVDF) organic-inorganic flexible thermoelectric composite films

Miao Liu, Dudi Ren, Chenyu Ye, Tingwei Yin, Sanyin Qu\* and Peng'an Zong\*

12450



### Control of Cu morphology on TaN barrier and combined Ru-TaN barrier/liner substrates for nanoscale interconnects from atomistic kinetic Monte Carlo simulations

Samuel Aldana,\* Cara-Lena Nies and Michael Nolan\*

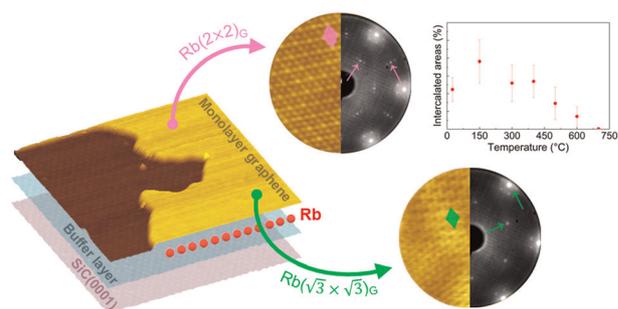


## PAPERS

12465

### Rubidium intercalation in epitaxial monolayer graphene

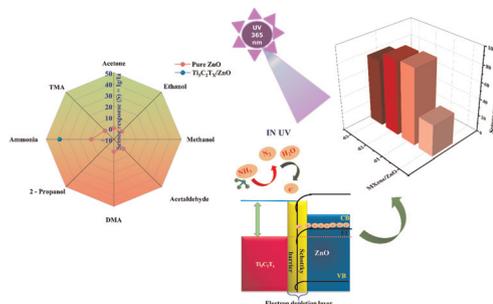
Letizia Ferbel,\* Stefano Veronesi, Tevfik Onur Mentès, Lars Buß, Antonio Rossi, Neeraj Mishra, Camilla Coletti, Jan Ingo Flege, Andrea Locatelli and Stefan Heun



12473

### Unveiling superior NH<sub>3</sub> sensing performance: ultrafast response and enhanced recovery kinetics in Ti<sub>3</sub>C<sub>2</sub>T<sub>x</sub>/ZnO nano-hybrid sensors with UV-induced Schottky junctions

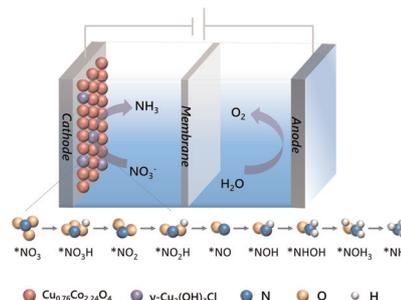
Gowri Shonali Natarajamani, Veera Prabu Kannan and Sridharan Madanagurusamy\*



12491

### A Cu<sub>0.76</sub>Co<sub>2.24</sub>O<sub>4</sub>/γ-Cu<sub>2</sub>(OH)<sub>3</sub>Cl composite catalyst for efficient neutral nitrate reduction

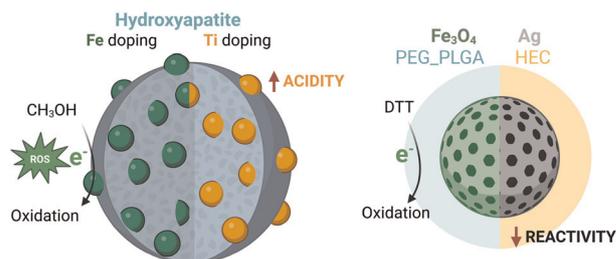
Xian Liu, Min Wang, Wenhao Yang, Zixuan Wei and Jian Yang\*



12503

### *In chemico* categorization of magnetite-, hydroxyapatite-, and Ag-derived hybrid nanobiomaterials based on the surface oxidative reactivity: implications of doping and coating

V. Alcolea-Rodriguez,\* I. Fenoglio, M. Blosi, M. Serantoni, F. C. Simeone, I. Zanoni, A. L. Costa, R. Portela and M. A. Bañares\*



## CORRECTION

12516

**Correction: Dual-targeting hybrid nanoparticles for the delivery of SN38 to Her2 and CD44 overexpressed human gastric cancer**

Zhe Yang, Huiyan Luo, Zhong Cao, Ya Chen, Jinbiao Gao, Yingqin Li, Qing Jiang, Ruihua Xu\* and Jie Liu\*

