

# Nanoscale

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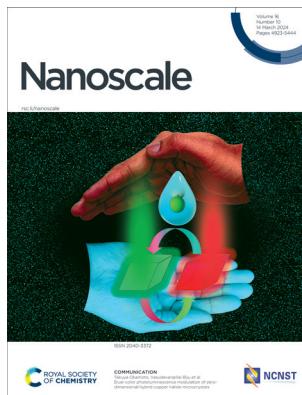
ISSN 2040-3372 CODEN NANOHL 16(10) 4923–5444 (2024)



Cover

See Roberto Purrello,  
Alessandro D'Urso *et al.*,  
pp. 5137–5148.

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D'Urso from *Nanoscale*,  
2024 **16**, 5137



Inside cover

inside cover  
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Vasudevanpillai Biju et al.,  
pp. 5107–5114.

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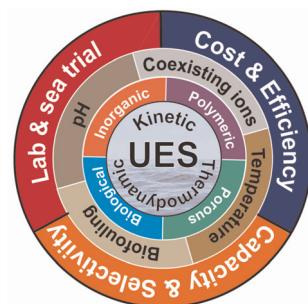
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4937

## Enhanced uranium extraction from seawater: from the viewpoint of kinetics and thermodynamics

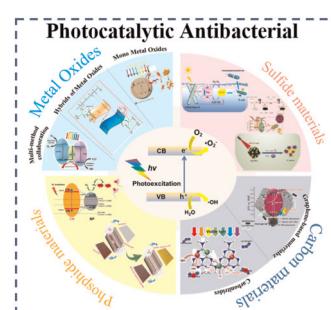
Sania Shabbir, Nailiang Yang\* and Dan Wang\*



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# Photocatalytic antibacterial agents based on inorganic semiconductor nanomaterials: a review

Ping She, Shuming Li, Xuejing Li, Heng Rao, Xiaoju Men  
and Jun-sheng Qin\*





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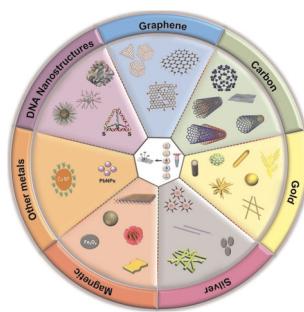
Fundamental questions  
Elemental answers

## REVIEWS

4974

**Nanomaterials in electrochemical nanobiosensors of miRNAs**

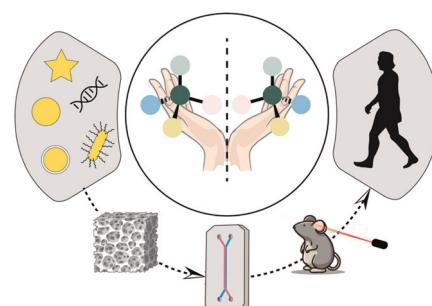
Marziyeh Mousazadeh, Maryam Daneshpour, Saeed Rafizadeh Tafti, Nahid Shoaie, Fatemeh Jahanpeyma, Faezeh Mousazadeh, Fatemeh Khosravi, Patricia Khashayar,\* Mostafa Azimzadeh\* and Ebrahim Mostafavi\*



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**Chiral nanomaterials in tissue engineering**

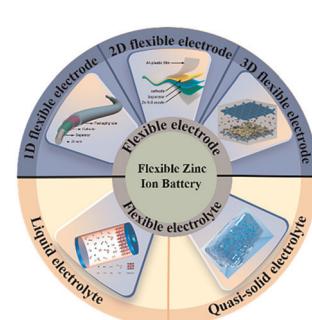
Zhenxu Yang, Arun Jaiswal, Qiankun Yin, Xiaoqi Lin, Lu Liu, Jiarong Li, Xiaochen Liu, Zhejun Xu, Jiao Jiao Li\* and Ken-Tye Yong\*



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**Recent progress in critical electrode and electrolyte materials for flexible zinc-ion batteries**

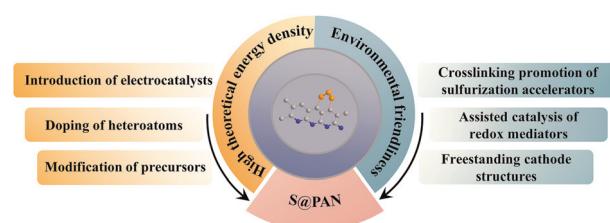
Yunjie Mao, Bangchuan Zhao,\* Jin Bai, Peiyao Wang, Xuebin Zhu and Yuping Sun



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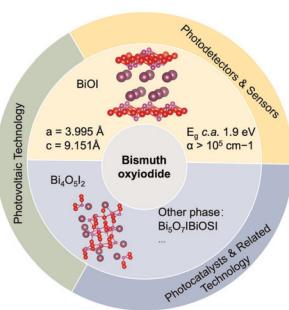
**Sulfurized polyacrylonitrile as cathodes for advanced lithium–sulfur batteries: advances in modification strategies**

Xiaolin Wu, Yaqi Zhao,\* Hang Li, Cheng Zhou,\* Xuanpeng Wang\* and Lingzhi Du\*



## REVIEWS

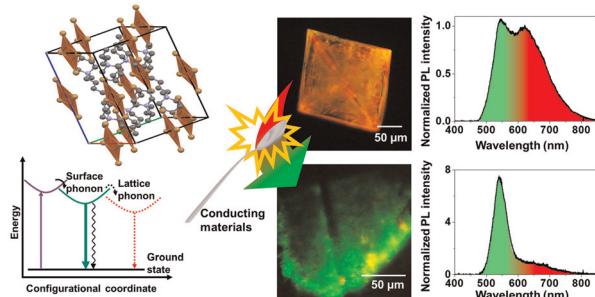
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**Potential application of bismuth oxyiodide (BiOI) when it meets light**

Zaichun Sun and Tahta Amrillah\*

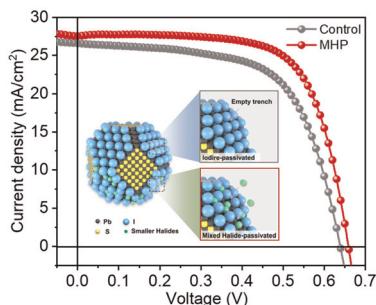
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**Dual-color photoluminescence modulation of zero-dimensional hybrid copper halide microcrystals**

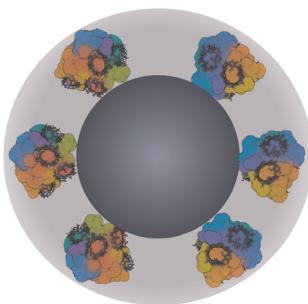
Rahul Ghosh Dastidar, Takuya Okamoto,\* Kiyonorai Takahashi, Yuta Takano, Chakkooth Vijayakumar, Challapalli Subrahmanyam and Vasudevanpillai Biju\*

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**In situ synergistic halogen passivation of semiconducting PbS quantum dot inks for efficient photovoltaics**

Xiaobo Ding, Xin Wen, Yuto Kawata, Yang Liu, Guozheng Shi, Refka ben Ghazi, Xiang Sun, Yujie Zhu, Hao Wu, Haotian Gao, Qing Shen, Zeke Liu\* and Wanli Ma

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**Exploiting cyclodextrins as artificial chaperones to enhance enzyme protection through supramolecular engineering**

Ali Foroutan Kalourazi, Seyed Amirabbas Nazemi, Ajmal Roshan Unniram Parambil, Ruben Muñoz-Tafalla, Paula Vidal, S. Shirin Shahangian, Victor Guallar, Manuel Ferrer and Patrick Shahgaldian\*

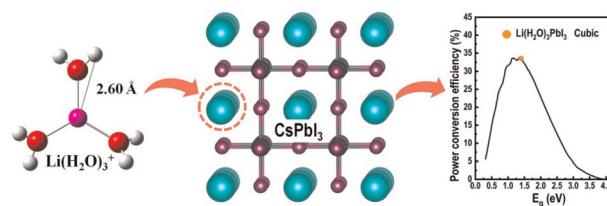


## COMMUNICATIONS

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**Superalkali halide perovskites with suitable direct band gaps for photovoltaic applications**

Tingwei Zhou\* and Anlong Kuang

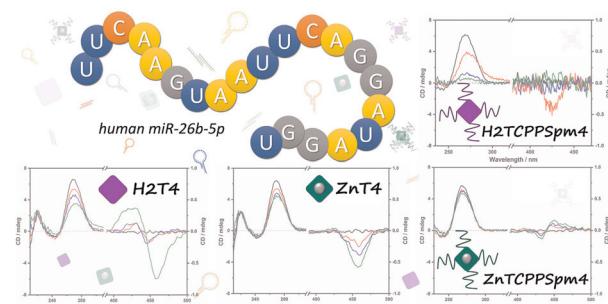


## PAPERS

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**Interactions between achiral porphyrins and a mature miRNA**

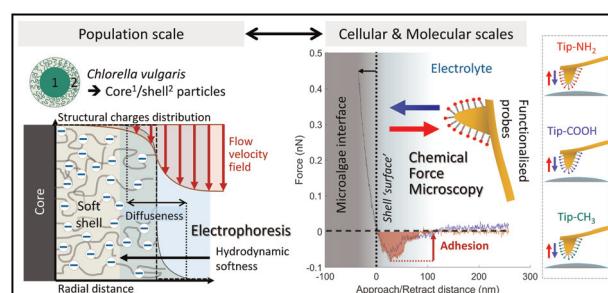
Gabriele Travagliante, Massimiliano Gaeta, Chiara M. A. Gangemi, Salvatore Alaimo, Alfredo Ferro, Roberto Purrello\* and Alessandro D'Urso\*



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**Physicochemical surface properties of *Chlorella vulgaris*: a multiscale assessment, from electrokinetic and proton uptake descriptors to intermolecular adhesion forces**

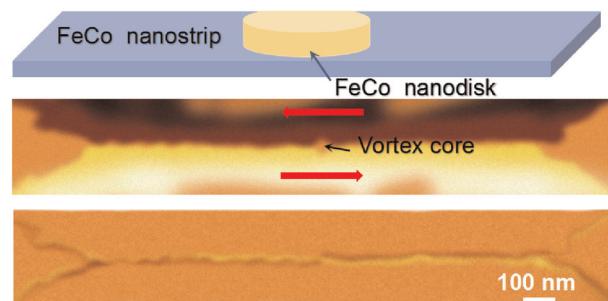
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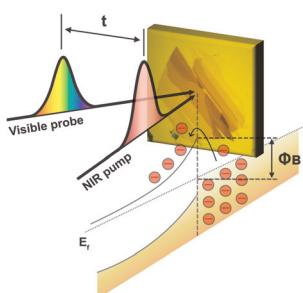
**High-resolution imaging of 3D stray-field components with a Fe<sub>3</sub>O<sub>4</sub> nanoparticle sensor**

Yan Qi, Yihong Kan and Zhenghua Li\*



## PAPERS

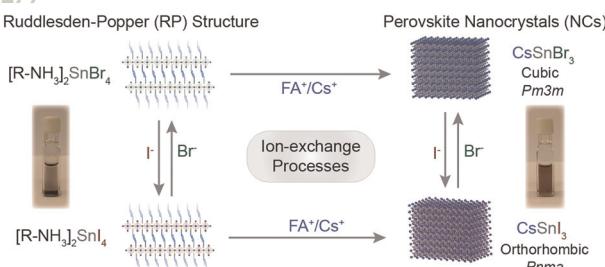
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### Optical spectroscopic detection of Schottky barrier height at a two-dimensional transition-metal dichalcogenide/metal interface

Du Chen, Surendra B. Anantharaman, Jinyuan Wu, Diana Y. Qiu, Deep Jariwala and Peijun Guo\*

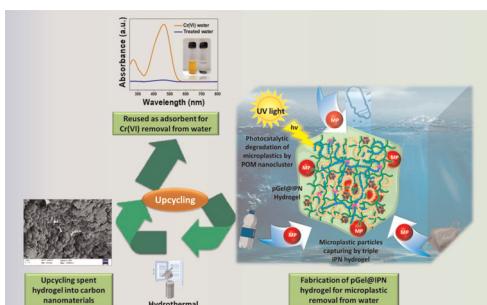
5177



### Structural and optical control through anion and cation exchange processes for Sn-halide perovskite nanostructures

Kushagra Gahlot, Julius Meijer and Loredana Protesescu\*

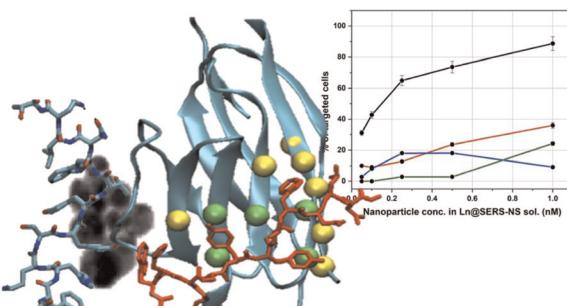
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### Polyoxometalate nanocluster-infused triple IPN hydrogels for excellent microplastic removal from contaminated water: detection, photodegradation, and upcycling

Soumi Dutta,\* Ashok Misra and Suryasarathi Bose\*

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### SERS nanostructures with engineered active peptides against an immune checkpoint protein

Marina Gobbo, Isabella Caligiuri, Micaela Giannetti, Lucio Litti, Claudia Mazzuca, Flavio Rizzolio, Antonio Palleschi and Moreno Meneghetti\*

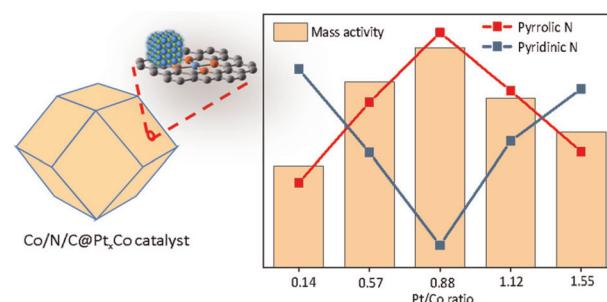


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**Unraveling a volcanic relationship of Co/N/C@Pt<sub>x</sub>Co catalysts toward oxygen electro-reduction**

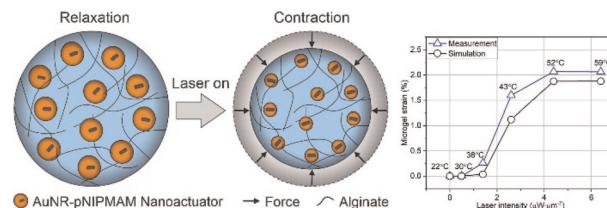
Yangdong Zhou, Junda Chen, Zhiyin Huang, Yuqin Peng, Lixin Xing, Chunmei Tang, Ning Wang, Ling Meng, Mingjie Wu,\* Lei Du\* and Siyu Ye\*



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**A multiscale approach to assess thermomechanical performance and force generation in nanorobotic microgels**

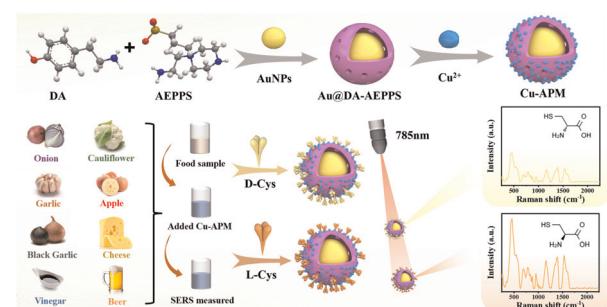
Chen Wang, Philipp Harder, Nergishan İyisan, Bolin Li, Lukas Hiendlmeier, Bernhard Wolfrum and Berna Özkal\*



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**Metal-assisted core–shell plasmonic nanoparticles for small molecule biothiol analysis and enantioselective recognition**

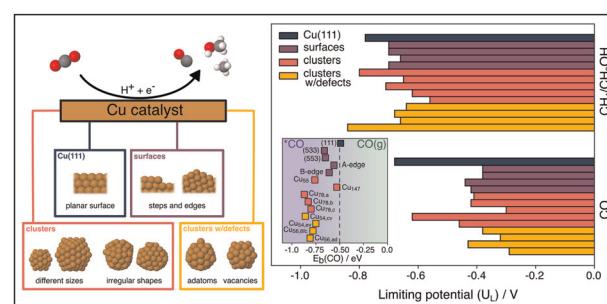
Meihuang Zeng, Linmin Chen, Xiaocong Hou, Jingwen Jin, QiuHong Yao, Tingxiu Ye, Zhiyong Guo,\* Xiaomei Chen\* and Xi Chen\*



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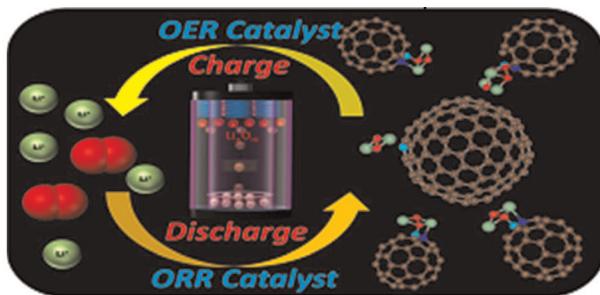
**Calculations of the effect of catalyst size and structure on the electrocatalytic reduction of CO<sub>2</sub> on Cu nanoclusters**

Geoffrey R. Weal, Kristinn Ingi Guðmundsson, Frank D. Mackenzie, John R. Whiting, Nicholas B. Smith, Egill Skúlason and Anna L. Garden\*



## PAPERS

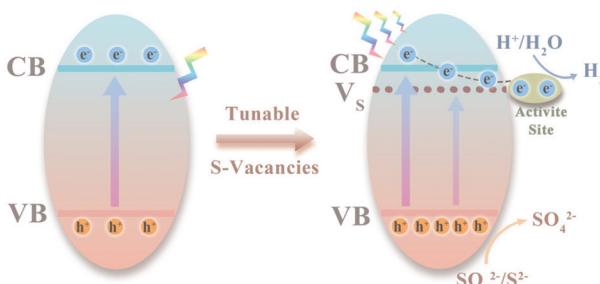
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## Localized charge-induced ORR/OER activity in doped fullerenes for Li–air battery applications

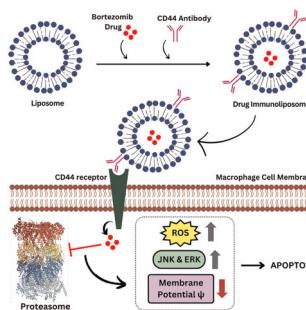
Nishchal Bharadwaj and Biswarup Pathak\*

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Facile synthesis of  $\text{Zn}_{0.5}\text{Cd}_{0.5}\text{S}$  nanosheets with tunable S vacancies for highly efficient photocatalytic hydrogen evolution

Linfen Yang, Yuhua Wang\* and Yong Peng\*

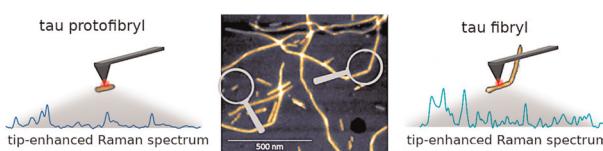
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## Bortezomib-loaded immunoliposomes against CD44 expressing macrophages: an interplay for inflammation resolution

Simran Nasra, Haly Shukla, Milonee Patel and Ashutosh Kumar\*

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## Tip-enhanced Raman spectroscopy reveals the structural rearrangements of tau protein aggregates at the growth phase

Kamila Sofińska,\* Sara Seweryn, Katarzyna Skirlińska-Nosek, Jakub Barbasz and Ewelina Lipiec\*

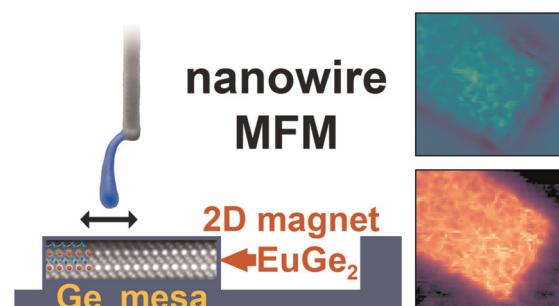


## PAPERS

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**Mapping the phase-separated state in a 2D magnet**

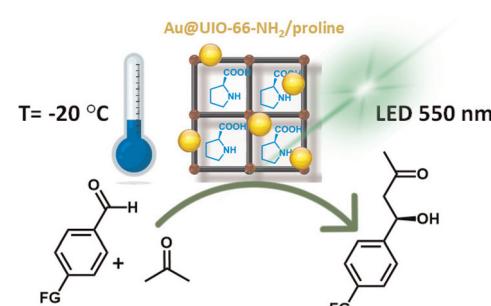
Hinrich Mattiat, Lukas Schneider, Patrick Reiser, Martino Poggio,\* Pardis Sahafi, Andrew Jordan, Raffi Budakian, Dmitry V. Averyanov, Ivan S. Sokolov, Alexander N. Taldenkov, Oleg E. Parfenov, Oleg A. Kondratev, Andrey M. Tokmachev and Vyacheslav G. Storchak\*



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**Merging gold plasmonic nanoparticles and L-proline inside a MOF for plasmon-induced visible light chiral organocatalysis at low temperature**

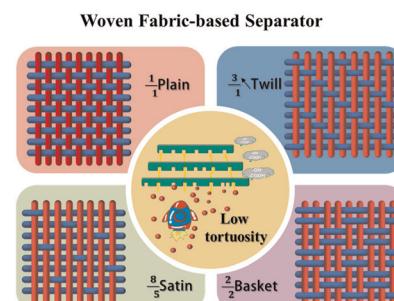
A. Kushnarenko, A. Zabelina, O. Guselnikova, E. Miliutina, B. Vokatá, D. Zabelin, V. Burtsev, R. Valiev, Z. Kolska, M. Paidar, V. Sykora, P. Postnikov,\* V. Svorcík and O. Lyutakov\*



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**Woven fabric-based separators with low tortuosity for sodium-ion batteries**

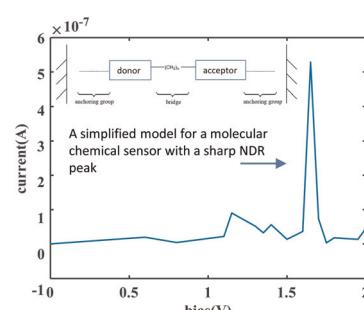
Tianyun Zhang,\* Lirong Zhang, Fujuan Wang, Yanci Wang, Tian Zhang and Fen Ran\*



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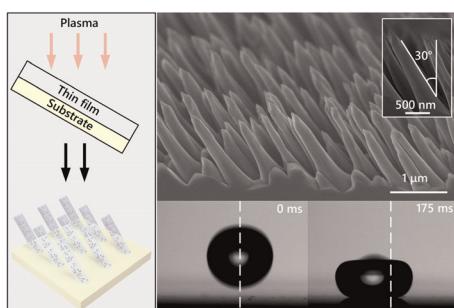
**A computational model for a molecular chemical sensor**

Mengxuan Li, Clotilde S. Cucinotta and Andrew P. Horsfield\*



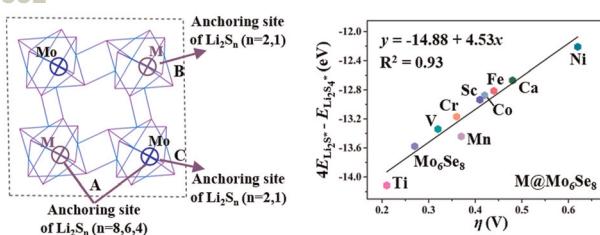
## PAPERS

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**Oriented bouncing of droplets with a small Weber number on inclined one-dimensional nanoforests**

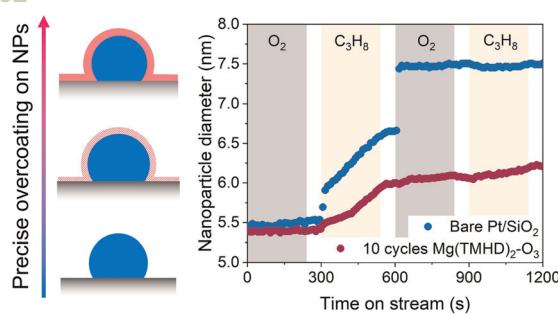
Mao Li, Qiming Guo, Jing Wen, Fei Zhan, Meng Shi, Na Zhou, Chengjun Huang, Lei Wang\* and Haiyang Mao\*

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**A doping strategy to regulate the adsorption energy of  $\text{Li}_2\text{S}_4$  and  $\text{Li}_2\text{S}$  to promote sulfur reduction on Chevrel phase  $\text{Mo}_6\text{Se}_8$  in lithium–sulfur batteries**

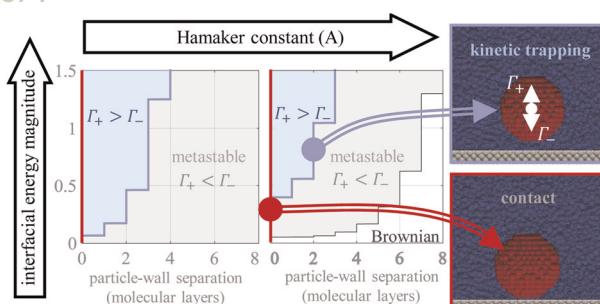
Tengfei Duan, Dong Fan, Zhongyun Ma\* and Yong Pei\*

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**Controlling Pt nanoparticle sintering by sub-monolayer MgO ALD thin films**

Zhiwei Zhang, Matthias Filez, Eduardo Solano, Nithin Poonkottil, Jin Li, Matthias M. Minjauw, Hilde Poelman, Martin Rosenthal, Philipp Brüner, Vladimir V. Galvita, Christophe Detavernier and Jolien Dendooven\*

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**Kinetic trapping of nanoparticles by solvent-induced interactions**

Troy Singletary, German Drazer, Amy C. Marschilok, Esther S. Takeuchi, Kenneth J. Takeuchi\* and Carlos E. Colosqui\*

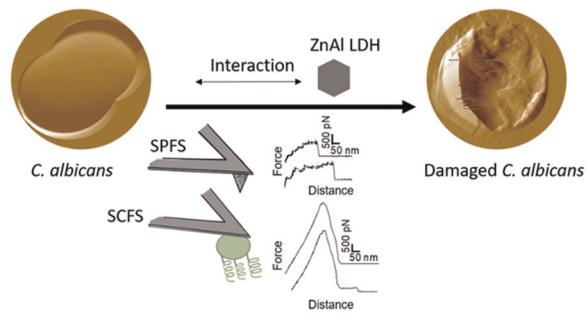


## PAPERS

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**Understanding the nanoscale adhesion forces between the fungal pathogen *Candida albicans* and antimicrobial zinc-based layered double hydroxides using single-cell and single-particle force spectroscopy**

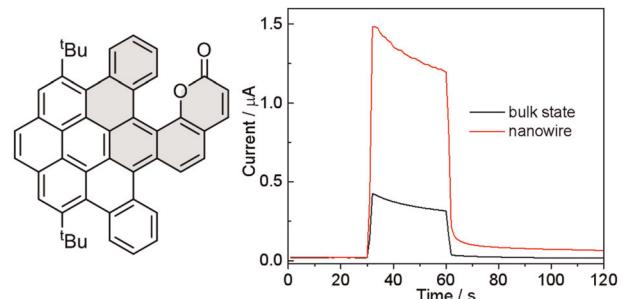
Jazia Awassa, Samantha Soulé, Damien Cornu, Christian Ruby and Sofiane El-Kirat-Chatel\*



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**Coumarin-embedded [5]helicene derivatives: synthesis, X-ray analysis and photoconducting properties**

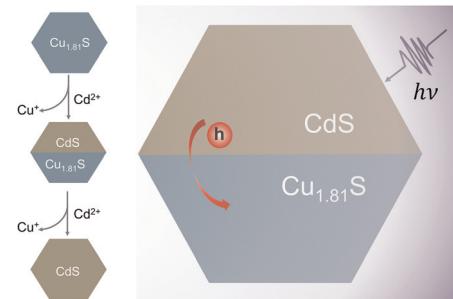
Hui Yang, Guofeng Chen,\* Ran Zhang, Yanjie Zhu and Jinchong Xiao\*



5401

**Visible light-induced hole transfer in single-nanoplate Cu<sub>1.81</sub>S–CdS heterostructures**

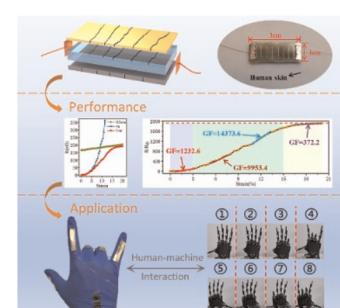
Chang Wang, Zhaozhe Chen, Si Xiao\* and Jun He\*



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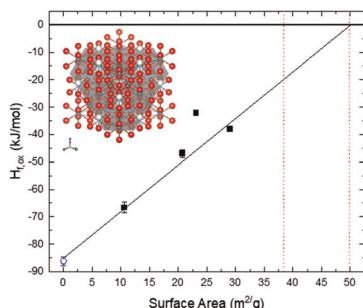
**A double-crack structure for bionic wearable strain sensors with ultra-high sensitivity and a wide sensing range**

Di Zhu, Shengshun Duan, Jiachen Liu, Shanyan Diao, Jianlong Hong, Shengxin Xiang, Xiao Wei, Peng Xiao, Jun Xia, Wei Lei, Baoping Wang, Qiongfeng Shi and Jun Wu\*



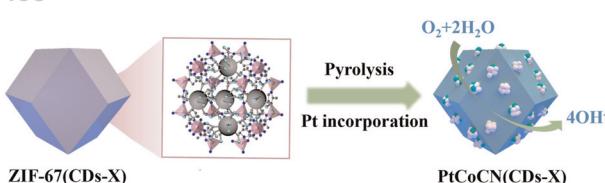
## PAPERS

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**Surface thermodynamics of yttrium titanate pyrochlore nanomaterials**

Margaret E. Reece, Jiahong Li, Andrew C. Strzelecki, Juan Wen, Qiang Zhang and Xiaofeng Guo\*

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**Low platinum loading electrocatalyst supported on a carrier derived from carbon dots doped ZIF-67 for the ORR and zinc-air batteries**

Lijing Yang, Junhong Ma,\* Yuemei Liu, Chaoyun Ma,\* Xue Yu and Zhaohui Chen

## EXPRESSION OF CONCERN

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**Expression of concern: Intelligent nanoflowers: a full tumor microenvironment-responsive multimodal cancer theranostic nanoplatform**

Xunan Jing, Yanzi Xu, Daomeng Liu, Youshen Wu, Na Zhou, Daquan Wang, Kai Yan and Lingjie Meng\*



## CORRECTION

5442

**Correction: pH-Responsive fluorescent graphene quantum dots for fluorescence-guided cancer surgery and diagnosis**

Zetan Fan, Shixin Zhou, Cesar Garcia, Louzhen Fan\* and Jiangbing Zhou\*