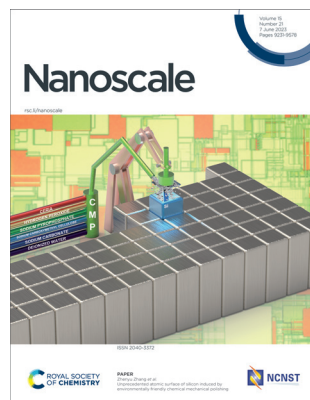


IN THIS ISSUE

ISSN 2040-3372 CODEN NANOHL 15(21) 9231-9578 (2023)



Cover
See Zhenyu Zhang *et al.*,
pp. 9304–9314.

Image reproduced by
permission of Zhenyu Zhang
from *Nanoscale*, 2023, **15**,
9304.



Inside cover
See Jooho Park,
Young-Ho Lee *et al.*,
pp. 9315–9328.

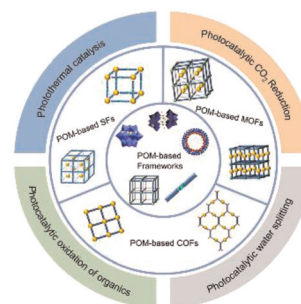
Image reproduced by
permission of Young-Ho Lee
from *Nanoscale*, 2023, **15**,
9315.

REVIEWS

9242

Polyoxometalate-based frameworks for photocatalysis and photothermal catalysis

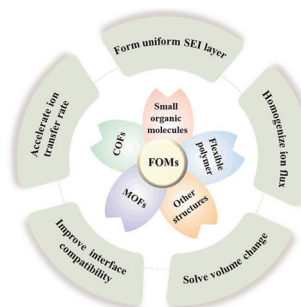
Xiaofei Chen,* Hongzhuo Wu, Xinjian Shi and Lixin Wu*



9256

Advances in functional organic material-based interfacial engineering on metal anodes for rechargeable secondary batteries

Ruijuan Shi,* Zhen Shen, Qianqian Yue and Yong Zhao*



Editorial Staff

Executive Editor

Michaela Mühlberg

Managing Editor

Heather Montgomery

Editorial Production Manager

Jonathon Watson

Senior Publishing Editor

Daniella Ferlucio

Development Editor

Edward Gardner

Publishing Editors

Matthew Blow, Chris Dias, Hemna Fathima, Juan Gonzalez, Eleanor Griffiths, Rob Hinde, Ash Hyde, Sam Howell, Francesca Jacklin, Shruti Karnik, Sophie Koh, Tamara Kosikova, Evie Karkera, Brian Li, Sam Mansell, Carole Martin, Kirsty McRoberts, Cat Schofield, Charu Storr-Vijay, Manman Wang, Tom Williams, Ella White

Editorial Assistant

Elizabeth So

Publishing Assistant

Lee Colwill

Assistant Editor

Jie Gao, Yu Zhang

Publisher

Sam Keltie

For queries about submitted papers, please contact Jonathon Watson, Editorial Production Manager in the first instance.

E-mail: nanoscale@rsc.org

For pre-submission queries please contact Michaela Mühlberg, Executive Editor. E-mail: nanoscale-rsc@rsc.org
Nanoscale (electronic: ISSN 2040-3372) is published 48 times a year by the Royal Society of Chemistry, Thomas Graham House, Science Park, Milton Road, Cambridge, UK CB4 0WF.

All orders, with cheques made payable to the Royal Society of Chemistry, should be sent to the Royal Society of Chemistry Order Department, Royal Society of Chemistry, Thomas Graham House, Science Park, Milton Road, Cambridge, CB4 0WF, UK

Tel +44 (0)1223 432398; E-mail orders@rsc.org

2023 Annual (electronic) subscription price: £1936/\$3155.

Customers in Canada will be subject to a surcharge to cover GST. Customers in the EU subscribing to the electronic version only will be charged VAT.

If you take an institutional subscription to any Royal Society of Chemistry journal you are entitled to free, site-wide web access to that journal. You can arrange access via Internet Protocol (IP) address at www.rsc.org/ip
Customers should make payments by cheque in sterling payable on a UK clearing bank or in US dollars payable on a US clearing bank.

Whilst this material has been produced with all due care, the Royal Society of Chemistry cannot be held responsible or liable for its accuracy and completeness, nor for any consequences arising from any errors or the use of the information contained in this publication. The publication of advertisements does not constitute any endorsement by the Royal Society of Chemistry or Authors of any products advertised. The views and opinions advanced by contributors do not necessarily reflect those of the Royal Society of Chemistry which shall not be liable for any resulting loss or damage arising as a result of reliance upon this material. The Royal Society of Chemistry is a charity, registered in England and Wales, Number 207890, and a company incorporated in England by Royal Charter (Registered No. RC000524), registered office: Burlington House, Piccadilly, London W1J 0BA, UK, Telephone: +44 (0) 207 4378 6556.

Advertisement sales:

Tel +44 (0) 1223 432246; Fax +44 (0) 1223 426017;

E-mail advertising@rsc.org

For marketing opportunities relating to this journal, contact marketing@rsc.org

Nanoscale

rsc.li/nanoscale

Nanoscale publishes experimental and theoretical work across the breadth of nanoscience and nanotechnology.



Published in collaboration with the National Centre for Nanoscience and Technology, Beijing, China

Editorial Board

Editors-in-Chief

Chunli Bai, National Centre for Nanoscience and Nanotechnology, China
Dirk Guldi, Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany

Associate Editors

Cinzia Casiraghi, University of Manchester, UK
Gianluigi Cunierti, TU Dresden (Technische Universität Dresden), Germany
Qing Dai, National Center for Nanoscience and Technology of China, China
Yves Dufréne, Université Catholique de Louvain, Belgium

Andrea Ferrari, University of Cambridge, UK
Dong Ha Kim, Ewha Womens University, South Korea
Christian Klinker, University of Rostock, Germany
Quan Li, The Chinese University of Hong Kong, Hong Kong
Zhiqun Lin, National University of Singapore, Singapore
Xing Yi Ling, Nanyang Technological University, Singapore
Xiaogang Liu, National University of Singapore, Singapore
Renzhi Ma, National Institute for Materials

Science, Japan
Janet Macdonald, Vanderbilt University, USA
Teresa Pellegrino, Istituto Italiano di Tecnologia, Italy
Elena Shevchenko, Argonne National Laboratory, USA
Jonathan Veinot, University of Alberta, Canada
Umesh Waghmare, Jawaharlal Nehru Centre for Advanced Scientific Research, India
Manzhou Zhu, Anhui University, China
Jin Zou, The University of Queensland, Australia

Advisory Board

Zhenan Bao, Stanford University, USA
Amanda Barnard, Australian National University, Australia
Suryasarathi Bose, Indian Institute of Science Bangalore, India
Stephanie Brock, Wayne State University, USA
Raffaella Buonsanti, EPFL, Switzerland
Chunying Chen, National Center for Nanoscience and Technology of China, China
Jingyi Chen, University of Arkansas, USA
Wenlong Chen, Monash University, Australia
Xiaodong Chen, Nanyang Technological University, Singapore
Serena Cussen, University of Sheffield, UK
Mita Dasog, Dalhousie University, Canada
Kristen Fichthorn, Penn State University, USA
Christy Haynes, University of Minnesota, USA
Guohua Jia, Curtin University, Australia
Xingyu Jiang, Southern University of Science and Technology, China
Rongchao Jin, Carnegie Mellon University, USA
Song Jin, University of Wisconsin, USA
Jesse Jokerst, University of California San Diego, USA
Kouros Kalantar-zadeh, The University of Sydney, Australia
Yamuna Krishnan, University of Chicago, USA
Katharina Landfester, Max Planck Institute for Polymer Research, Germany
Pooi See Lee, Nanyang Technological University, Singapore
Graham Leggett, The University of Sheffield, UK
Changming Li, Southwest University, China

Jie Liu, Duke University, USA
Laura Na Liu, Max Planck Institute for Intelligent Systems, Germany
Yunqi Liu, Institute of Chemistry, Chinese Academy of Sciences, China
Wei Lu, University of Michigan, USA
Liberato Manna, Istituto Italiano di Tecnologia, Italy
Anna Fontcuberta i Morral, EPFL, Switzerland
Catherine Murphy, University of Illinois at Urbana-Champaign, USA
Kostya (Ken) Ostrikov, Queensland University of Technology, Australia
So-Jung Park, Ewha Womens University, Korea
T Pradeep, Indian Institute of Technology Madras, India
Lakshmi Polavarapu, University of Vigo, Spain
Narayan Pradhan, Indian Association for the Cultivation of Science, India
Dong Qin, Georgia Institute of Technology, USA
Paolo Samori, Université de Strasbourg, France
Michael Sailor, University of California, San Diego, USA
Zhigang Shuai, Tsinghua University, China
Sara Skrabalack, Indiana University, USA
Francesco Stellacci, EPFL, Switzerland
Hong-Bo Sun, Jilin University, China
Ling-Dong Sun, Peking University, China
Shouheng Sun, Brown University, USA
Xiaoming Sun, Beijing University of Chemical Technology, China
Dmitri Talapin, University of Chicago, USA
Zhiyong Tang, National Center for NanoScience and Technology, China

Mauricio Terrones, The Pennsylvania State University, USA
Sarah Tolbert, University of California, Los Angeles, USA
Ventsislav Valev, University of Bath, UK
Miriam Vitiello, CNR Nano, Italy
Jianfang Wang, Chinese University of Hong Kong, Hong Kong SAR
Benjamin Wiley, Duke University, USA
Xiaojun Wu, University of Science and Technology of China, China
Yujie Xiong, University of Science and Technology of China, China
Hongxing Xu, Wuhan University, China
Lin Xu, Nanjing Normal University, China
Ya Yang, Beijing Institute of Nanoenergy and Nanosystems, China
Jinhua Ye, National Institute for Materials Science, Japan
Xiao Cheng Zeng, University of Nebraska-Lincoln, USA
Gang Zhang, Agency for Science, Technology and Research, Singapore
Hua Zhang, City University of Hong Kong, China
Miqin Zhang, University of Washington, USA
Yuliang Zhao, National Center for Nanoscience and Technology, China

Information for Authors

Full details on how to submit material for publication in Nanoscale are given in the Instructions for Authors (available from <http://www.rsc.org/authors>). Submissions should be made via the journal's homepage: rsc.li/nanoscale

Authors may reproduce/republish portions of their published contribution without seeking permission from the Royal Society of Chemistry, provided that any such republication is accompanied by an acknowledgement in the form: (Original Citation)–Reproduced by permission of the Royal Society of Chemistry.

This journal is © The Royal Society of Chemistry 2023. Apart from fair dealing for the purposes of research or private study for non-commercial purposes, or criticism or review, as permitted under the Copyright, Designs and Patents Act 1988 and the Copyright and Related Rights Regulation 2003, this publication may only be reproduced, stored or transmitted, in any form or by any means, with the prior permission in writing of the Publishers or in the case of reprographic reproduction in accordance with the terms of licences issued by the Copyright Licensing Agency in the UK. US copyright law is applicable to users in the USA.

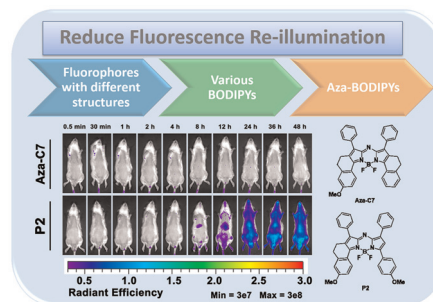
Registered charity number: 207890



9290

Selection of an aggregation-caused quenching-based fluorescent tracer for imaging studies in nano drug delivery systems

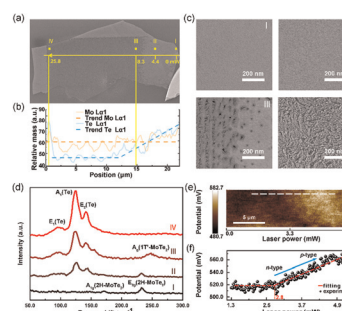
Xin Ji, Yifan Cai, Xiaochun Dong, Wei Wu and Weili Zhao*



9297

Laser doping of 2D material for precise energy band design

Xiang Tan, Shu Wang, Qiaoxuan Zhang, Juxing He, Shengyao Chen, Yusong Qu, Zhenzhou Liu, Yong Tang, Xintong Liu, Cong Wang,* Quan Wang* and Qian Liu*

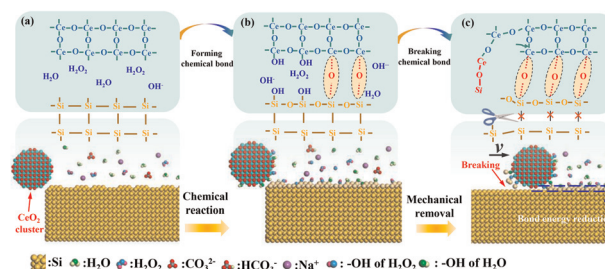


PAPERS

9304

Unprecedented atomic surface of silicon induced by environmentally friendly chemical mechanical polishing

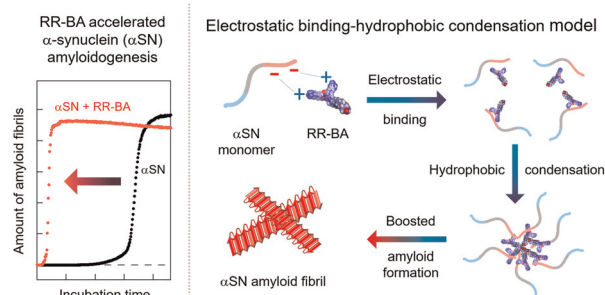
Xiangxiang Cui, Zhenyu Zhang,* Shiqiang Yu, Xin Chen, Chunjing Shi, Hongxiu Zhou, Fanning Meng, Jiaxin Yu and Wei Wen



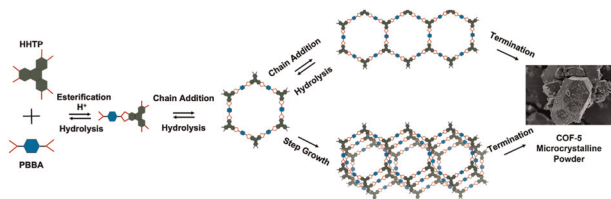
9315

An amphiphilic material arginine–arginine–bile acid promotes α -synuclein amyloid formation

Yuxi Lin, So-Hyeon Park, Eugene Bok, Yunseok Heo, Seong-Bin Yang, Yoon-Sun Yi, Jun-Hyuck Lee, Donghyun Seo, Eunae Jo, Sungsu Lim, Yun Kyung Kim, József Kardos, Kyoung-Seok Ryu, Jaekwang Kim, Joocho Park* and Young-Ho Lee*



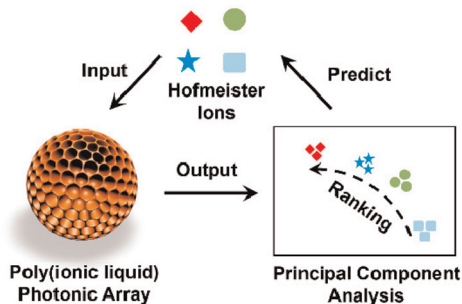
9329



Microkinetic insights into the role of catalyst and water activity on the nucleation, growth, and dissolution during COF-5 synthesis

Anish V. Dighe, Rajan R. Bhawnani, Prem K.R. Podupu, Naveen K. Dandu, Anh T. Ngo, Santanu Chaudhuri and Meenesh R. Singh*

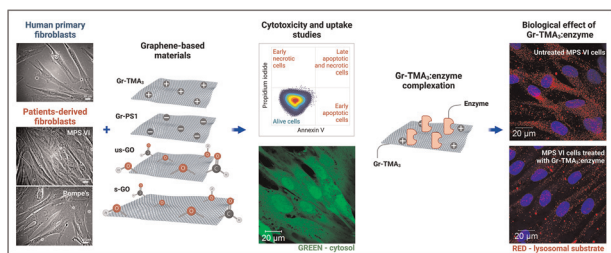
9339



Visual demonstration and prediction of the Hofmeister series based on a poly(ionic liquid) photonic array

Wenyun Li, Ning Gao, Wanlin Zhang, Kai Feng, Kang Zhou, Hongwei Zhao, Guokang He, Weigang Liu and Guangtao Li*

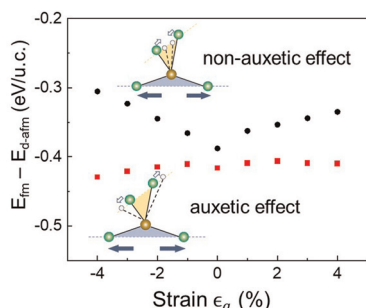
9348



Defect-free graphene enhances enzyme delivery to fibroblasts derived from patients with lysosomal storage disorders

Yingxian Chen, Tooba Taufiq, Niting Zeng, Neus Lozano, Angeliki Karakasidi, Heather Church, Ana Jovanovic, Simon A. Jones, Adyasha Panigrahi, Igor Larrosa, Kostas Kostarelos, Cinzia Casiraghi and Sandra Vranic*

9365



Novel two-dimensional magnets with an in-plane auxetic effect

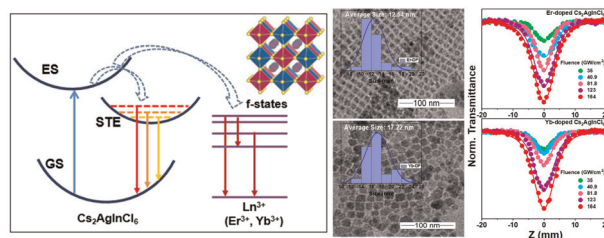
Rui-Zi Zhang, Jinbo Pan, Yu-Yang Zhang and Shixuan Du*



9372

Tunable near-infrared emission and three-photon absorption in lanthanide-doped double perovskite nanocrystals

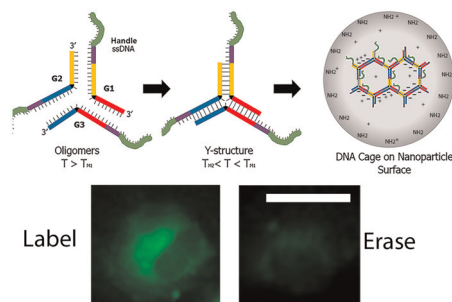
Md Soif Ahmed, Lavadiya Sireesha, Sudhanshu Kumar Nayak, Rangarajan Bakthavatsalam, Dipanjan Banerjee, Venugopal Rao Soma, Janardan Kundu and Sai Santosh Kumar Raavi*



9390

DNA-caged nanoparticles via electrostatic self-assembly

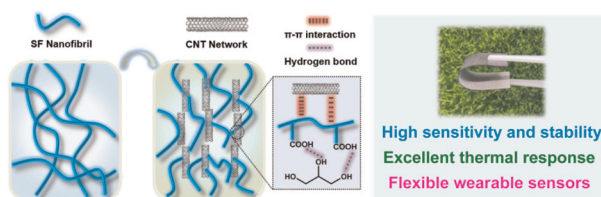
Elizabeth Jergens, Silvio de Araujo Fernandes-Junior, Yixiao Cui, Ariel Robbins, Carlos E. Castro, Michael G. Poirier, Metin N. Gurcan, Jose J. Otero* and Jessica O. Winter*



9403

A one-pot approach to prepare stretchable and conductive regenerated silk fibroin/CNT films as multifunctional sensors

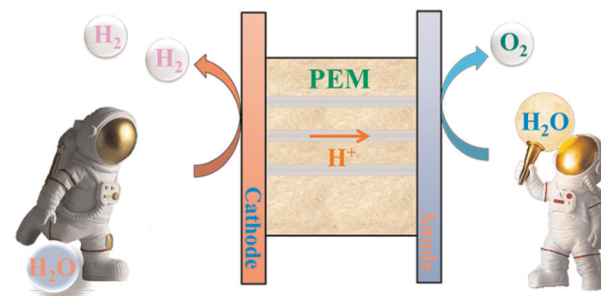
Qiujie Meng, Lunyu Zhao, Yu Geng, Pengxiang Yin, Zhiping Mao, Xiaofeng Sui, Meixin Zhao, Edmondo M. Benetti and Xueling Feng*



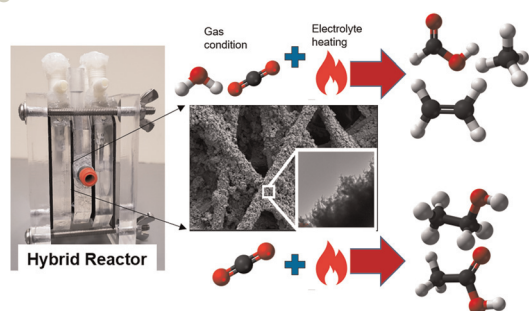
9413

Pyrochlore-type cobalt and manganese antimonate electrocatalysts with excellent activity and stability for OER in acidic solution

Yingchao Wang, Huining Zhao, YuMin Guo, Jingjing Wu, Xianglong Lu* and Xin Tang*



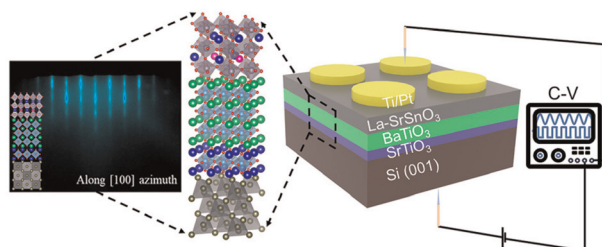
9423



Controlling product selectivity in hybrid gas/liquid reactors using gas conditions, voltage, and temperature

Seung-Hoon Lee, Brandon Iglesias, Henry O. Everitt* and Jie Liu*

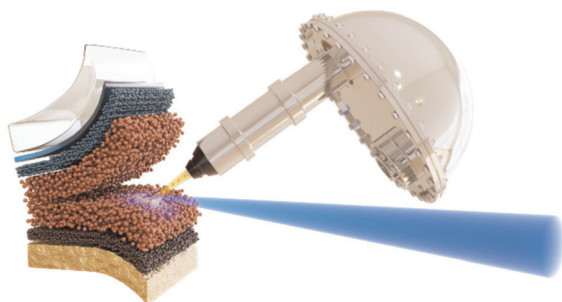
9432



Post-annealing optimization of the heteroepitaxial La-doped SrSnO₃ integrated on silicon via ALD

Yu Zhang, Shen Hu,* Pei-Yu Chen, Jiyuan Zhu, Bojia Chen, Rongxu Bai, Hao Zhu, Lin Chen, David W. Zhang, Jack C. Lee, Qingqing Sun, John G. Ekerdt* and Li Ji*

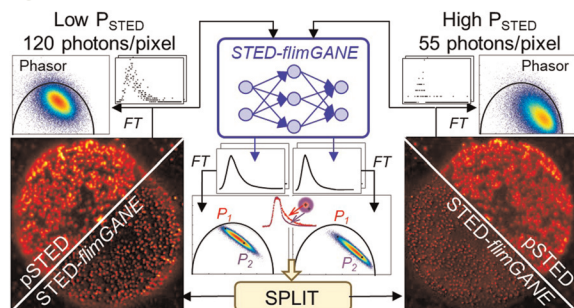
9440



Inside a nanocrystal-based photodiode using photoemission microscopy

Mariarosa Cavallo, Rodolphe Alchaar, Erwan Bossavit, Huichen Zhang, Tung Huu Dang, Adrien Khalili, Yoann Prado, Mathieu G. Silly, James K. Utterback, Sandrine Ithurria, Pavel Dudin, José Avila, Debora Pierucci and Emmanuel Lhuillier*

9449



Spatial resolution enhancement in photon-starved STED imaging using deep learning-based fluorescence lifetime analysis

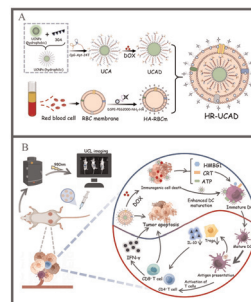
Yuan-I Chen, Yin-Jui Chang, Yuansheng Sun, Shih-Chu Liao, Samantha R. Santacruz and Hsin-Chih Yeh*



9457

Erythrocyte membrane-camouflaged DNA-functionalized upconversion nanoparticles for tumor-targeted chemotherapy and immunotherapy

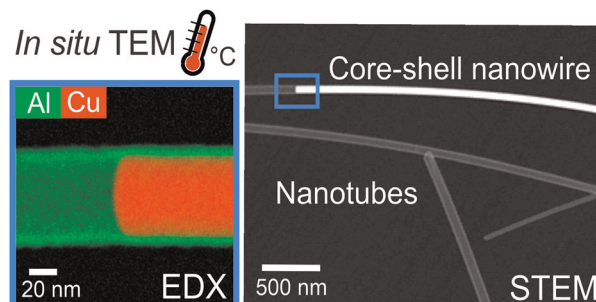
Qinjie Kou, Yufen Huang, Yanrong Su, Lu Lu, Xisheng Li, Haiye Jiang, Rong Huang, Jian Li* and Xinmin Nie*



9477

From metal nanowires to ultrathin crystalline ALD nanotubes: process development and mechanism revealed by *in situ* TEM heating experiments

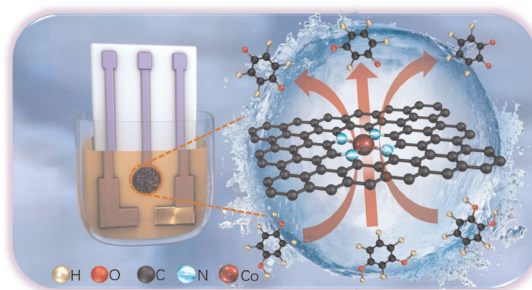
Lilian Maria Vogl,* Peter Schweizer, Laszlo Pethö, Amit Sharma, Johann Michler and Ivo Utke



9484

A single-atom cobalt integrated flexible sensor for simultaneous detection of dihydroxybenzene isomers

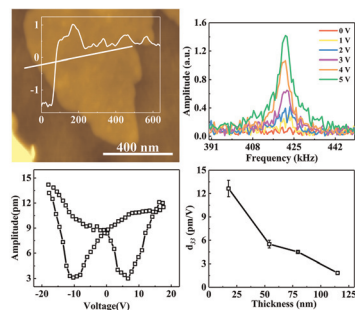
Guang Xuan Hu, Qianghai Rao, Ge Li, Yan Zheng, Yuhang Liu, Chunxian Guo, Fuhua Li, Fang Xin Hu,* Hong Bin Yang* and Feng Chen*



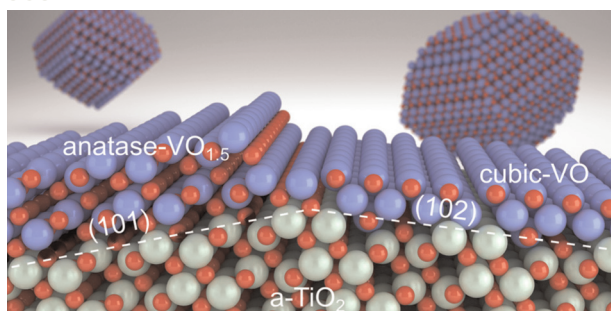
9496

Intrinsic piezoelectricity of 2D violet phosphorene

Dingyi Yang, Wei Xu, Boyu Wang, Yu Zhang, Yongmei Wang, Jing Ning,* Rusen Yang,* Yizhang Wu, Wei Zhong, Yong Wang* and Yue Hao



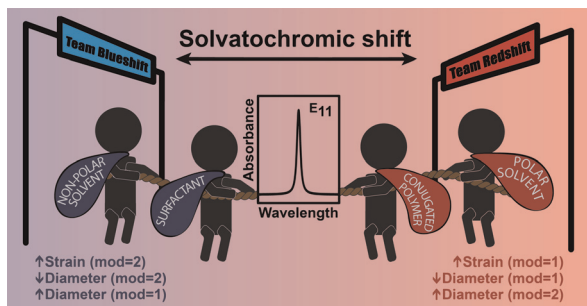
9503



Redox dynamics of 2D crystalline vanadium oxide phases on high-index anatase facets

Martin Ek, Anita Godiksen, Logi Arnarson, Poul Georg Moses, Søren B. Rasmussen, Magnus Skoglundh, Eva Olsson and Stig Helveg*

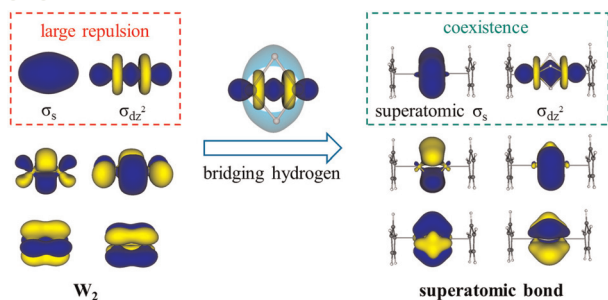
9510



Solvatochromism in SWCNTs suspended by conjugated polymers in organic solvents

Andrzej Dzieńia,* Dominik Just and Dawid Janas*

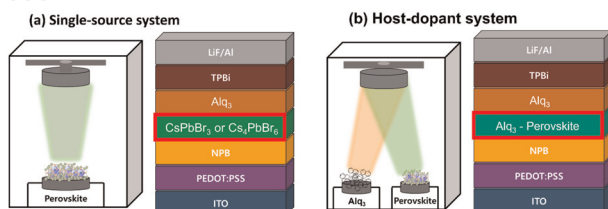
9525



Stabilizing hydrogen-mediated sextuple bonds by quintuple superatomic bonding and a σ_{dz^2} bond

Dan Li and Longjiu Cheng*

9533



CsPbBr₃ and Cs₄PbBr₆ perovskite light-emitting diodes using a thermally evaporated host-dopant system

Sa-Rang Bae, Myeong Jin Seol and Soo Young Kim*

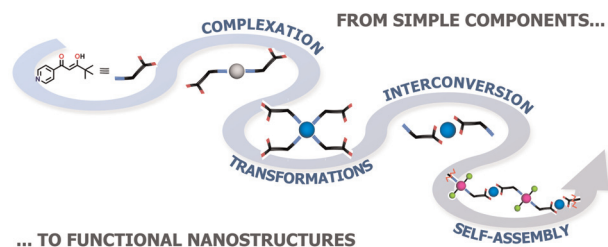


PAPERS

9543

Enhanced catalytic performance derived from coordination-driven structural switching between homometallic complexes and heterometallic polymeric materials

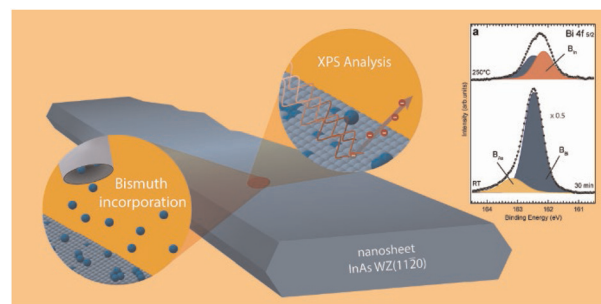
Gracjan Kurpik, Anna Walczak, Grzegorz Markiewicz, Jack Harrowfield and Artur R. Stefankiewicz*



9551

Tunable 2D surface Bismuth incorporation on InAs nanosheets

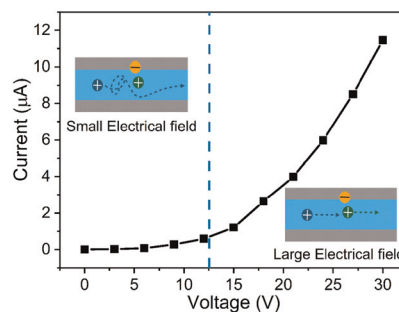
Sandra Benter, Yi Liu, Renan Da Paixao Maciel, Chin Shen Ong, Lassi Linnala, Dong Pan, Austin Irish, Yen-Po Liu, Jianhua Zhao, Hongqi Xu, Olle Eriksson, Rainer Timm and Anders Mikkelsen*



9560

Surface-charge governed ionic blockade in angstrom-scale latent-track channels

Yanbo Xie,* Deli Shi, Wenhui Wang and Ziheng Wang



9567

Solvent-resolved self-assemblies of cholesteryl-cyanostilbene conjugates with photo- and thermo-responsiveness

Shuqing Zhang, Aiyao Hao* and Pengyao Xing*

