Nanoscale Advances

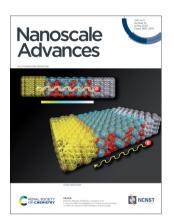
An open access journal publishing across the breadth of nanoscience and nanotechnology

rsc.li/nanoscale-advances

The Royal Society of Chemistry is the world's leading chemistry community. Through our high impact journals and publications we connect the world with the chemical sciences and invest the profits back into the chemistry community.

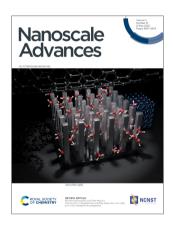
IN THIS ISSUE

ISSN 2516-0230 CODEN NAADAI 5(10) 2667-2834 (2023)



Cover

See Martino Aldrigo, Emiliano Laudadio et al... pp. 2748-2755. Image reproduced by permission of Emiliano Laudadio and Martino Aldrigo from Nanoscale Adv... 2023, 5, 2748.



Inside cover

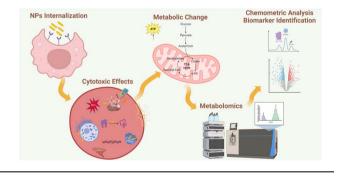
See Mohammad Awashra and Piotr Młynarz, pp. 2674-2723. Image reproduced by permission of Mohammad Awashra, using the building blocks of Dr. Joseph Manion with permission, from Nanoscale Adv., 2023, 5, 2674. The authors thank Prof. Sami Franssila for his advice and funding.

REVIEWS

2674

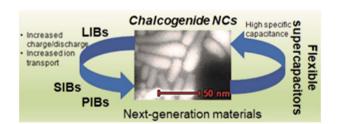
The toxicity of nanoparticles and their interaction with cells: an in vitro metabolomic perspective

Mohammad Awashra* and Piotr Młynarz



Transition metal chalcogenides for next-generation energy storage

Soubantika Palchoudhury,* Karthik Ramasamy, Jinchen Han, Peng Chen and Arunava Gupta*



Editorial Staff

Executive Editor

Jeremy Allen

Deputy Editor

Hannah Kerr

Editorial Assistant Rosie Hague

Editorial Production Manager

Christopher Goodall

Assistant Editors

Zita Zachariah and Serra Arslancan Sengelen

Neil Hammond

For queries about submitted papers, please contact Christopher Goodall, Editorial Production Manager in the first instance. E-mail: nanoscaleadvances@rsc.org

For pre-submission queries please contact Jeremy Allen, Executive Editor, E-mail: nanoscaleadvances-rsc@rsc.org

Nanoscale Advances (electronic: ISSN 2516-0230) is published 24 times a year by the Royal Society of Chemistry, Thomas Graham House, Science Park, Milton Road, Cambridge, UK CB4 0WF.

Nanoscale Advances is a Gold Open Access journal and all articles are free to read. Please email orders@rsc.org to register your interest or contact 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

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 Advances

rsc.li/nanoscale-advances

Nanoscale Advances 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 Kong, Hong Kong Gianaurelio (Giovanni) Cuniberti, TU Dresden, Zhiqun Lin, National University of Singapore,

Qing Dai, National Center for Nanoscience and Xing Yi Ling, Nanyang Technological Technology of China, China Yves Dufrêne, Université Catholique de Louvain, Belgium

Andrea Ferrari, University of Cambridge, UK Dong Ha Kim, Ewha Womens University, Christian Klinke, University of Rostock,

Germany Quan Li. The Chinese University of Hong

Singapore

University, Singapore Xiaogang Liu, National University of Singapore, Singapore

Renzhi Ma, National Institute for Materials Science, Japan Janet Macdonald, Vanderbilt University, USA

Teresa Pellegrino, Instituto Italiano di Tecnologia, Italy Elena Shevchenko, Argonne National Laboratory, USA

Ionathan Veinot, University of Alberta, Canada Umesh Waghmare, JNCASR, India Jinlan Wang, Southeast Univeristy, China Manzhou Zhu, Anhui University, China Jin Zou, University of Queensland, Australia

Advisory Board

Suryasarathi Bose, Indian Institute of Science Bangalore, India

Stephanie Brock, Wayne State University, USA Raffaella Buonsanti, EPFL, Switzerland Chunying Chen, National Centre for Nanoscience and Technology of China, China Jingvi Chen, University of Arkansas, USA Xiaodong Chen, Nanyang Technological University, Singapore

Wenlong Cheng, Monash University, Australia Serena Cussen, University of Sheffield, UK Kristen Fichthorn, Penn State University, USA Christy Haynes, Univeristy 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

Kourosh Kalantar-zadeh, The University of Sydney, Australia

Katharina Landfester, Max Planck Institute for Polymer Research, Germany Dattatray Late, CSIR - National Chemical Laboratory, India

Pooi See Lee, Nanyang Technological University, Singapore

Changming Li, Southwest University, China

Jie Liu, Duke University, USA Laura Na Liu, Max Planck Institute for Intelligent Systems, Germany Liberato Manna, Instituto Italiano di Tecnologia, Italy

Anna Fontcuberta i Morral, EPFL, Switzerland Catherine Murphy, University of Illinois at Urbana-Champaign, USA

Kostya Ostrikov, Queensland University of Technology, Australia

So-Jung Park, Ewha Womans University, Korea Lakshmi Polavarapu, University of Vigo, Spain Thalappil Pradeep, Indian Institute of

Technology Madras, India Narayan Pradhan, Indian Association for the Cultivation of Science, India

Dong Oin, Georgia Tech University, USA Michael Sailor, University of California, San Diego, USA

Hyeon Suk Shin, Ulsan National Institute of Science and Technology, South Korea Zhigang Shuai, Tsinghua University, China Sara Skrabalak, Indiana University, USA Francesco Stellacci, EPFL, Switzerland Hong-Bo Sun, Jilin 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

Ventsislay Valey, University of Bath, UK Miriam Vitiello, CNR Nanotec, 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, Chinese Academy of Sciences,

Jinhua Ye, National Institute for Materials Science, Japan

Xiao Cheng Zeng, University of Nebraska Lincoln, USA

Gang Zhang, Institute of High Performance Computing, Singapore Hua Zhang, City University of Hong Kong,

Miqin Zhang, University of Washington, USA

Information for Authors

Full details on how to submit material for publication in Nanoscale Advances 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-advances

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

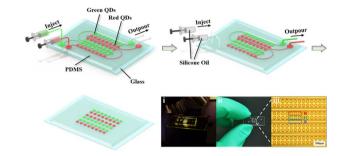


COMMUNICATION

2743

Microfluidic static droplet generated quantum dot arrays as color conversion layers for full-color micro-LED displays

Licai Zhu, Jin Tao,* Panyuan Li, Wenchao Sun, Jiwei Li, KaiLi Fan, Jinguang Lv, Yuxin Qin, Kaifeng Zheng, Baixuan Zhao, Yingze Zhao, Yupeng Chen, Yingwen Tang, Weibiao Wang and Jingqiu Liang*

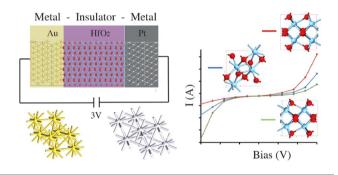


PAPERS

2748

First-principles investigation of interface phenomena in hafnium-based metal-insulator-metal diodes

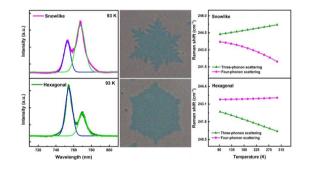
Eleonora Pavoni, Elaheh Mohebbi, Pierluigi Stipa, Luca Pierantoni, Davide Mencarelli, Mircea Dragoman, Martino Aldrigo* and Emiliano Laudadio*



2756

Morphological dependent exciton dynamics and thermal transport in MoSe₂ films

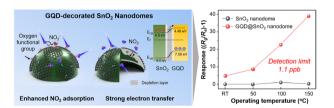
Jay Deep Gupta, Priyanka Jangra, Bishnu Pada Majee and Ashish Kumar Mishra*



2767

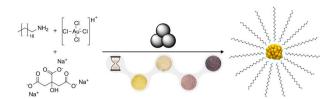
Role of graphene quantum dots with discrete band gaps on SnO₂ nanodomes for NO₂ gas sensors with an ultralow detection limit

Jinho Lee, Minsu Park, Young Geun Song, Donghwi Cho, Kwangjae Lee, Young-Seok Shim* and Seokwoo Jeon*



PAPERS

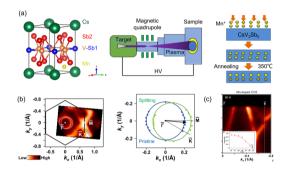
2776



In situ study of Au nanoparticle formation in a mechanochemical-aging-based method

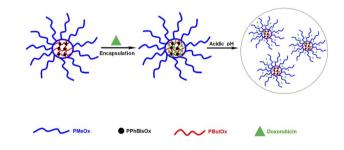
Austin J. Richard, Michael Ferguson, Blaine G. Fiss, Hatem M. Titi, Jesus Valdez, Nikolas Provatas, Tomislav Friščić* and Audrey Moores*

2785



Band splitting and enhanced charge density wave modulation in Mn-implanted CsV₃Sb₅

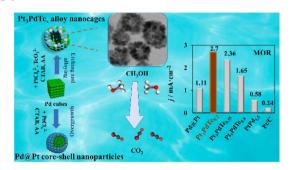
Xiaoxu Lei, Pengdong Wang, Mengjuan Mi, Yan Zhang, Aixi Chen, Liwu Cai, Ting Wang, Rong Huang, Yilin Wang,* Yiyao Chen* and Fang-Sen Li*



Poly(2-oxazoline)-based core cross-linked star polymers: synthesis and drug delivery applications

Nedah Alkattan, Noura Alasmael, Viko Ladelta, Niveen M. Khashab* and Nikos Hadjichristidis*

2804



Te-induced fabrication of Pt₃PdTe_{0.2} alloy nanocages by the self-diffusion of Pd atoms with unique MOR electrocatalytic performance

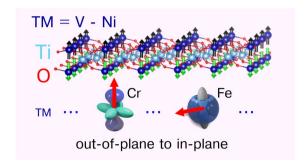
Yuhe Shi, Ling Zhang,* Huiwen Zhou, Ruanshan Liu, Shichen Nie, Guojie Ye, Fengxia Wu, Wenxin Niu,* Jing Long Han* and Ai Jie Wang

PAPERS

2813

Magnetic order and magnetic anisotropy in twodimensional ilmenenes

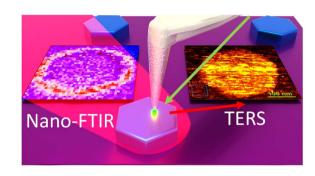
R. H. Aguilera-del-Toro, M. Arruabarrena, A. Leonardo and A. Ayuela*



2820

Local phonon imaging of AlN nanostructures with nanoscale spatial resolution

Ilya Milekhin,* Kirill Anikin, Nina N. Kurus, Vladimir G. Mansurov, Timur V. Malin, Konstantin S. Zhuravlev, Alexander G. Milekhin, Alexander V. Latyshev and Dietrich R. T. Zahn



CORRECTION

2831

Correction: A hierarchical integrated 3D carbon electrode derived from gingko leaves via hydrothermal carbonization of H_3PO_4 for high-performance supercapacitors

Han Liu, Fuming Zhang, Xinyu Lin, Jinggao Wu and Jing Huang*