

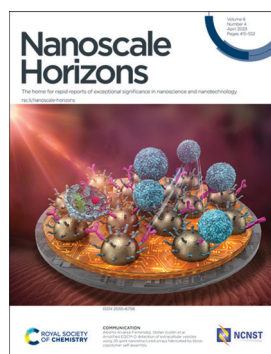
Nanoscale Horizons

The home for rapid reports of exceptional significance in nanoscience and nanotechnology
rsc.li/nanoscale-horizons

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 2055-6756 CODEN NHAOAW 8(4) 415-552 (2023)



Cover

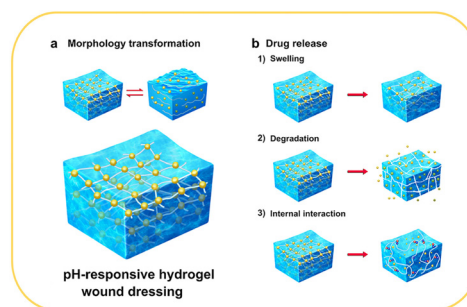
See Alberto Alvarez-Fernandez, Stefan Guldin *et al.*, pp. 460–472.
Image reproduced by permission of Yueyang Gao from *Nanoscale Horiz.*, 2023, 8, 460.

REVIEW

422

pH-Responsive wound dressings: advances and prospects

Zeyu Han, Mujie Yuan, Lubin Liu, Kaiyue Zhang, Baodong Zhao, Bin He, Yan Liang* and Fan Li*

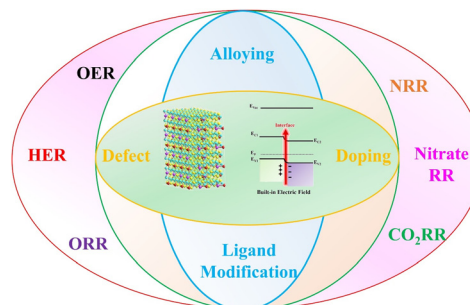


MINIREVIEWS

441

Interfacial built-in electric-field for boosting energy conversion electrocatalysis

Hui Xu,* Junru Li and Xianxu Chu*



Editorial Staff

Executive Editor

Michaela Mühlberg

Managing Editor

Heather Montgomery

Editorial Production Manager

Jonathon Watson

Senior Publishing Editor

Alex Metherell

Development Editor

Edward Gardner

Publishing Editors

Blake Baker, Matthew Blow, Chris Dias, Rob Hinde, Ash Hyde, Evie Karkera, Tamara Kosikova, Carole Martin, Kirsty McRoberts, Cat Schofield, Ella White, Tom Williams

Editorial Assistant

Elizabeth So

Assistant Editors

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: nanoscalehorizons@rsc.org

For pre-submission queries please contact

Michaela Mühlberg, Executive Editor.

E-mail: nanoscalehorizons-rsc@rsc.org

Nanoscale Horizons (print: ISSN 2055-6756 electronic:

ISSN 2055-6764) is published 12 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: £2727; \$4500.

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 Horizons

rsc.li/nanoscale-horizons

Nanoscale Horizons is the home for urgent short reports of exceptionally high quality & innovative nanoscience & nanotechnology



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

Editorial Board

Chair

Katharina Landfester, Max Planck Institute for Polymer Research, Germany

Scientific Editors

Katsuhiko Ariga, National Institute for Materials Science (NIMS), Japan

Wenlong Cheng, Monash University, Australia

Yves Dufrène, Université Catholique de Louvain, Belgium

Anna Fontcuberta i Morral, École polytechnique fédérale de Lausanne, Switzerland
Dirk Guld, Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany
Zhiyong Tang, National Center for Nanoscience and Technology, China
Jinlan Wang, Southeast University, China

Members

Michael Sailor, University of California, San Diego, USA
Sarah Tolbert, University of California, Los Angeles, USA
Miqin Zhang, University of Washington, USA

Advisory Board

Chunli Bai, Chinese Academy of Sciences, China
Uri Banin, Hebrew University of Jerusalem, Israel
Frank Caruso, University of Melbourne, Australia
Cinzia Casiraghi, The University of Manchester, UK
Paola Ceroni, University of Bologna, Italy
Chunying Chen, National Center for Nanoscience and Technology, China
Xiaodong Chen, Nanyang Technological University, Singapore
Serena Corr, University of Sheffield, UK
Harold Craighead, Cornell University, USA
Qing Dai, National Center for Nanoscience and Technology, China
Shuai Dong, Southeast University, China
Laura Fabris, Rutgers University, USA
Andrea Ferrari, University of Cambridge, UK
Raju Kumar Gupta, Indian Institute of Technology Kanpur, India
Xingyu Jiang, Southern University of Science and Technology, China
Rongchao Jin, Carnegie Mellon University, USA
Dong Ha Kim, Ewha Womans University, South Korea
Jang-Kyo Kim, University of New South Wales, Australia
Kostas Kostarelos, University of Manchester,

UK
Yamuna Krishnan, University of Chicago, USA
Tai Wei David Leong, National University of Singapore, Singapore
Quan Li, Chinese University of Hong Kong, Hong Kong
Xing Yi Ling, Nanyang Technological University, Singapore
Jie Liu, Duke University, USA
Xiaogang Liu, National University of Singapore, Singapore
Renzhi Ma, National Institute for Materials Science, Japan
Stefan Maier, Ludwig-Maximilians-Universität München, Germany
Liberato Manna, Istituto Italiano di Tecnologia, Italy
Chad Mirkin, Northwestern University, USA
Paul Mulvaney, University of Melbourne, Australia
Catherine Murphy, University of Illinois at Urbana-Champaign, USA
Valeria Nicolosi, Trinity College Dublin, Ireland
Dong Qin, Georgia Institute of Technology, USA
Sandra Rosenthal, Vanderbilt University, USA
Paolo Samori, Université de Strasbourg, France

Ester Segal, Technion - Israel Institute of Technology, Israel
Elena Shevchenko, Argonne National Laboratory, USA
Hisanori Shinohara, Nagoya University, Japan
Zuzanna Siwy, University of California, Irvine, USA
Sara Skrabalak, Indiana University, USA
Francesco Stellacci, École polytechnique fédérale de Lausanne, Switzerland
Ling-Dong Sun, Peking University, China
Shouheng Sun, Brown University, USA
Jonathan Veinot, University of Alberta, Canada
Umesh Waghmare, Jawaharlal Nehru Centre for Advanced Scientific Research, India
Jianfang Wang, Chinese University of Hong Kong, Hong Kong SAR
Sharon Weiss, Vanderbilt University, USA
Benjamin Wiley, Duke University, USA
Stefan Zauscher, Duke University, USA
Xiao Cheng Zeng, University of Nebraska-Lincoln, USA
Hongjie Zhang, Changchun Institute of Applied Chemistry, China
Hua Zhang, City University of Hong Kong, China
Manzhou Zhu, Anhui University, China
Jin Zou, University of Queensland, Australia

Community Board

Serena Carrara, CNRS Aix-Marseille Université, France
Arun Richard Chandrasekaran, The RNA Institute, University at Albany, SUNY, USA
Ying Diao, University of Illinois at Urbana-Champaign, USA
Qingchen Dong, Shanghai University, China
Yuanxing Fang, Fuzhou University, China
Azhar Fakharuddin, Interuniversity Microelectronics Centre, Belgium
Calum T. J. Ferguson, Max Planck Institute for Polymer Research, Germany
Lucas Güniat, EPFL, Switzerland
Marilena Hadjilidemetriou, University of Manchester, UK
Shumeng Hao, Georgia Institute of Technology, USA
Samuel S. Hinman, Berkeley Lights, Inc, USA
Nobuhiko Hosono, University of Tokyo, Japan
Jundie Hu, Suzhou University of Science and Technology, China
Shuaidong Huo, Xiamen University, China
Ignacio Insua, University of Santiago de Compostela, Spain
Debrina Jana, Indian Institute of Science Education and Research Mohali, India

Ruibin Jiang, Shaanxi Normal University, China
Yih Hong Lee, Nanyang Technological University, Singapore
Sarah Lerch, Chalmers University of Technology, Sweden
Li Li, Northeastern University, USA
Zhiyuan Liu, Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences, China
Saeed Nazemidashtarjandi, The University of Texas at Austin, USA
Sabina Alexandra Nicolae, Queen Mary University of London/Imperial College London, UK
Anamaria Orza, Emory University, USA
Pepita Pla-Vilanova, University of Lleida, Spain
Amirali Popat, The University of Queensland, Australia
Kalyan Raidongia, Indian Institute of Technology Guwahati, India
Satyajit Ratha, Indian Institute of Technology Bhubaneswar, India
Nathaniel Richey, Stanford University, USA

Jungki Ryu, Ulsan National Institute of Science and Technology, Korea
Lei Shao, Beijing Computational Science Research Center, China
Pengzhan Sun, University of Manchester, UK
Jing Tang, The University of Queensland, Australia
Yanlong Wang, Dalian Institute of Chemical Physics, China
Jiangxiexing Wu, Tianjin University, China
Tong Wu, Qingdao University, China
Wenzhuo Wu, Purdue University, USA
Xiuqiang Xie, Hunan University, China
Liguang Xu, Jiangnan University, China
Yikai Xu, Queen's University Belfast, UK
Nobuhiro Yanai, Kyushu University, Japan
Fei Zhang, Tianjin University, China
Zishuai Zhang, The University of British Columbia, Canada
Ya Zhou, Advanced Micro-Fabrication Equipment Inc., China
Kai Zhu, Harbin Engineering University, China
Xiaolu Zhuo, CICbiomagnum, Spain

Information for Authors

Full details on how to submit material for publication in Nanoscale Horizons 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-horizons

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

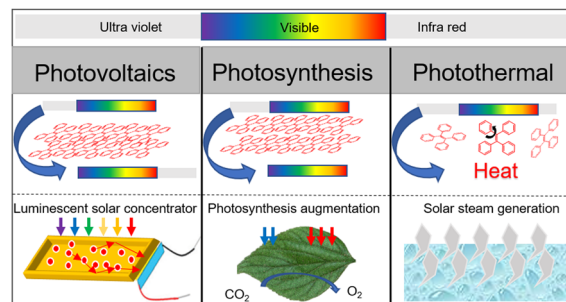


MINIREVIEWS

453

Recent advances in aggregation-induced emission materials for enhancing solar energy utilization

Haixiang Liu, Haotian Bai, Jacky W. Y. Lam, Ryan T. K. Kwok and Ben Zhong Tang*

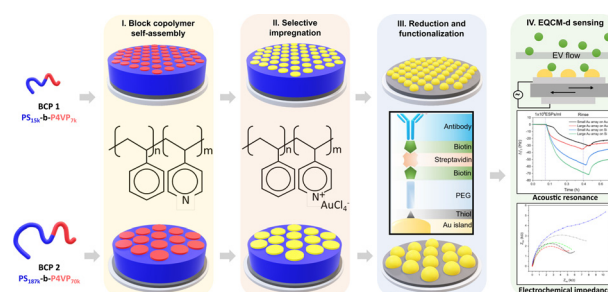


COMMUNICATIONS

460

Amplified EQCM-D detection of extracellular vesicles using 2D gold nanostructured arrays fabricated by block copolymer self-assembly

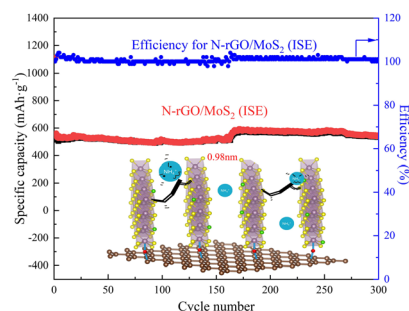
Jugal Suthar, Alberto Alvarez-Fernandez,* Esther Osarfo-Mensah, Stefano Angioletti-Uberti, Gareth R. Williams and Stefan Guldin*



473

An interlayer spacing design approach for efficient sodium ion storage in N-doped MoS₂

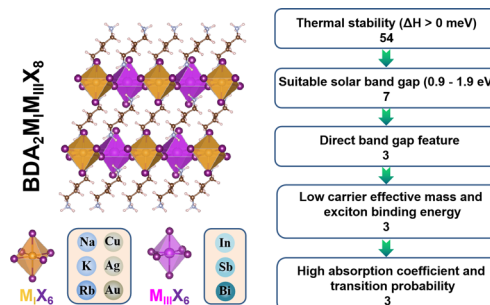
Peng Wang, Wenshan Gou, Tian Jiang, Wenjing Zhao, Kunpeng Ding, Huanxing Sheng, Xin Liu, Qingyu Xu* and Qi Fan*



483

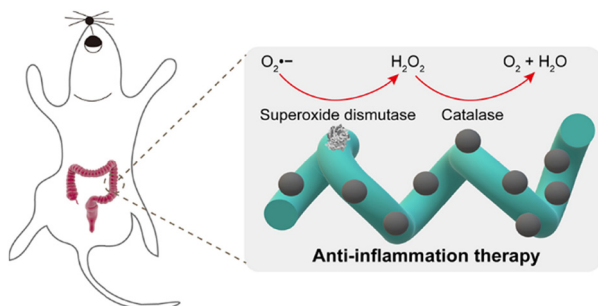
Discovering layered lead-free perovskite solar absorbers via cation transmutation

Ming Chen, Zhicheng Shan, Xiaofeng Dong, Shengzhong(Frank) Liu* and Zhuo Xu*



COMMUNICATIONS

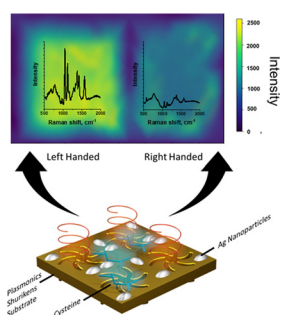
489



Integrated cascade catalysis of microalgal bioenzyme and inorganic nanozyme for anti-inflammation therapy

Qi-Wen Chen, Meng-Wei Cao, Ji-Yan Qiao, Qian-Ru Li and Xian-Zheng Zhang*

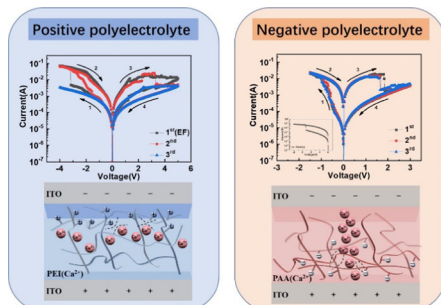
499



Coupling of plasmonic hot spots with shurikens for superchiral SERS-based enantiomer recognition

Olga Guselnikova,* Roman Elashnikov, Vaclav Svorcik, Martin Kartau, Cameron Gilroy, Nikolaj Gadegaard, Malcolm Kadodwala, Affar S. Karimullah* and Oleksiy Lyutakov*

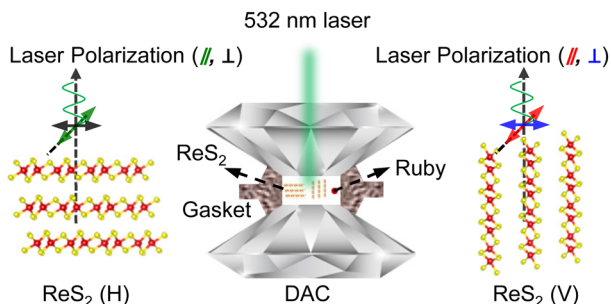
509



Evaluating charge-type of polyelectrolyte as dielectric layer in memristor and synapse emulation

Jingzhou Shi, Shaohui Kang, Jiang Feng, Jiaming Fan, Song Xue, Gangri Cai* and Jin Shi Zhao*

516



Orientation-polarization dependence of pressure-induced Raman anomalies in anisotropic 2D ReS₂

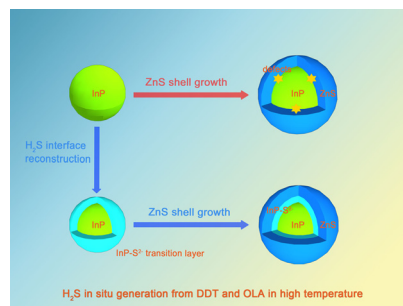
Ting Wen, Maodi Zhang, Jing Li, Chenyin Jiao, Shenghai Pei, Zenghui Wang* and Juan Xia*



522

InP/ZnS quantum dot photoluminescence modulation via *in situ* H₂S interface engineering

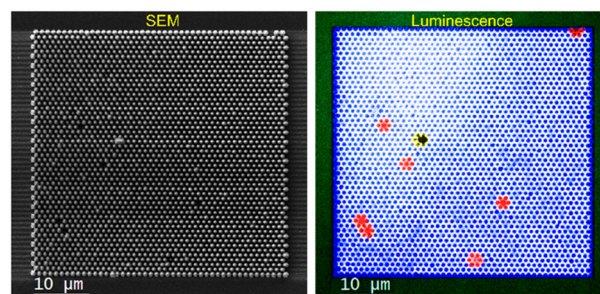
Xiang-Bing Fan, Dong-Wook Shin, Sanghyo Lee, Junzhi Ye, Shan Yu, David J. Morgan, Adrees Arbab, Jiajie Yang, Jeong-Wan Jo, Yoonwoo Kim, Sung-Min Jung, Philip R. Davies, Akshay Rao, Bo Hou and Jong Min Kim*



530

Core-shell GaN/AlGaIn nanowires grown by selective area epitaxy

Sonachand Adhikari,* Felipe Kremer, Mykhaylo Lysevykh, Chennupati Jagadish and Hark Hoe Tan*



543

A photonic artificial synapse with a reversible multifaceted photochromic compound

Deeksha Sharma, Dheemahi Rao and Bivas Saha*

