

Materials Advances

An open access journal publishing across the breadth of materials science

rsc.li/materials-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 2633-5409 CODEN MAADC9 4(18) 3897-4260 (2023)



Cover

See Huancai Lin, Liping Wu *et al.*, pp. 4110–4118. Image reproduced by permission of Dongru Chen from *Mater. Adv.*, 2023, 4, 4110.



Inside cover

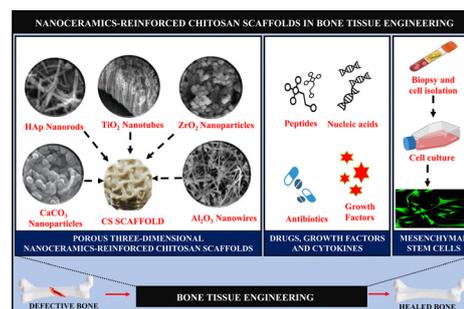
See Chitra Gurnani *et al.*, pp. 4119–4128. Image reproduced by permission of Sayali Shrishail Harke and Chitra Gurnani from *Mater. Adv.*, 2023, 4, 4119.

REVIEWS

3907

Nanoceramics-reinforced chitosan scaffolds in bone tissue engineering

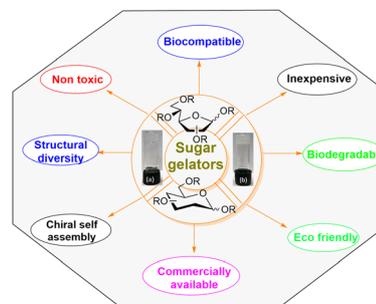
Ganesh Harini, Ramanathan Bharathi, Aravind Sankaranarayanan, Abinaya Shanmugavadivu and Nagarajan Selvamurugan*



3929

Recent advances in carbohydrate-based gelators

Rajdeep Tyagi, Kavita Singh, Nitin Srivastava* and Ram Sagar*



Editorial Staff**Executive Editor**

Jeremy Allen

Deputy Editor

Hannah Kerr

Editorial Production Manager

Christopher Goodall

Assistant Editors

Zita Zachariah, Serra Arslanac Sengelen and Zifei Lu

Editorial Assistant

Rosie Hague

Publishing Assistant

Allison Holloway

Publisher

Neil Hammond

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

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

Materials Advances (electronic: ISSN 2633-5409) is published 24 times a year by the Royal Society of Chemistry, Thomas Graham House, Science Park, Milton Road, Cambridge, UK CB4 0WE.

Materials 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 0WE, 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

Materials Advances

rsc.li/materials-advances

Materials Advances publishes experimental and theoretical work across the breadth of materials science.

Editorial Board**Editors-in-Chief**

Anders Hagfeldt, EPFL, Switzerland
Jeroen Cornelissen, University of Twente, The Netherlands
Natalie Stingelin, Georgia Institute of Technology, USA

Associate Editors

A. S. Achalkumar, Indian Institute of Technology, India
Veronica Augustyn, North Carolina State University, USA
Viola Birss, University of Calgary, Canada
Kaushik Chatterjee, Indian Institute of Science, India
Elizabeth Cosgriff-Hernandez, University of Texas at Austin, USA
Rachel Crespo-Otero, Queen Mary University of London, UK
Gemma-Louise Davies, University College London, UK
Goutam De, S N Bose National Centre for Basic Sciences, India
Renaud Demadrille, Interdisciplinary Research Institute of Grenoble, France
Håkan Engqvist, Uppsala University, Sweden
Antonio Facchetti, Northwestern University and Flexterra Corporation, USA

Ghim Wei Ho, National University of Singapore, Singapore
Yun Jeong Hwang, Korea Institute of Science and Technology, South Korea
Unyong Jeong, POSTECH, South Korea
Ji Jian, Zhejiang University, China
Oana Jurchescu, Wake Forest University, USA
Kisuk Kang, Seoul National University, South Korea
Subrata Kundu, Central Electrochemical Research Institute (CECRI), India
Dan Li, Jinan University, China
Mingzhu Li, Chinese Academy of Sciences, China
Shaoqin Liu, Harbin Institute of Technology, China
David Lou, Nanyang Technological University, Singapore
Yi-Chun Lu, The Chinese University of Hong Kong, Hong Kong
Martyn McLachlan, Imperial College London, UK
Yoshiko Miura, Kyushu University, Japan
Kasper Moth-Poulsen, Chalmers University of Technology, Sweden
Ana Flavia Nogueira, University of Campinas, Brazil

Erin Ratcliff, University of Arizona, USA
Federico Rosei, University of Trieste, Italy
Jennifer Rupp, Massachusetts Institute of Technology, USA
Miriam Unterlass, Vienna University of Technology, Austria
Yana Vaynzof, Technical University of Dresden, Germany
Maia Vergniory, Max Planck Institute for Chemical Physics of Solids, Germany
Jessica Winter, Ohio State University, USA
Lydia Wong, Nanyang Technological University, Singapore
Li-Zhu Wu, Technical Institute of Physics and Chemistry, China
Zhiguo Xia, South China University of Technology, China
Yusuke Yamauchi, University of Queensland, Australia
Chengzhong Yu, University of Queensland, Australia
Haoli Zhang, Lanzhou University, China
Ni Zhao, Chinese University of Hong Kong, Hong Kong
Zhen Zhou, Nankai University, China

Advisory Board

Please see the Materials Advances journal webpage for full details of our advisory board: rsc.li/materials-advances

Information for Authors

Full details on how to submit material for publication in Materials 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/materials-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

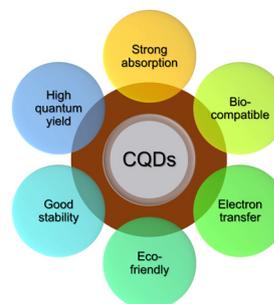


REVIEWS

3951

A review on plant derived carbon quantum dots for bio-imaging

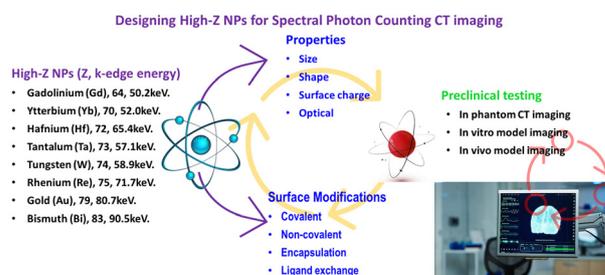
Ashok Kumar S., Dheeraj Kumar M., Mowsam Saikia, Renuga Devi N. and Subramania A.*



3967

High atomic number nanoparticles to enhance spectral CT imaging aspects

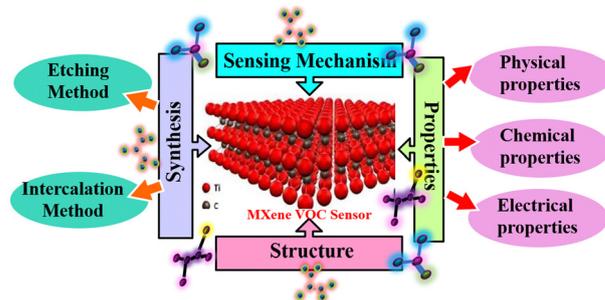
Isha Mutreja, Nabil Maalej, Ajeet Kaushik, Dhiraj Kumar* and Aamir Raja*



3989

MXene and their integrated composite-based acetone sensors for monitoring of diabetes

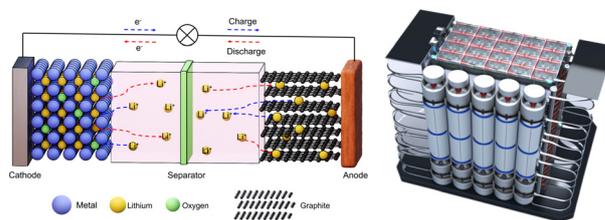
Monu Gupta, Arpit Verma, Priyanka Chaudhary and B. C. Yadav*



4011

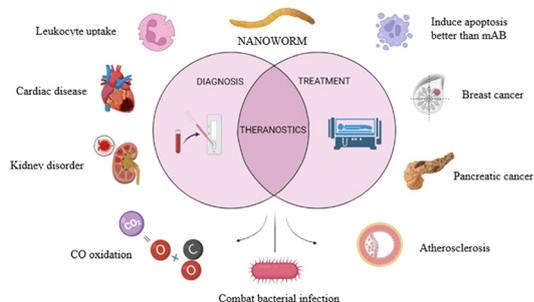
Research progress in liquid cooling technologies to enhance the thermal management of LIBs

Rui Zhou, Yumei Chen, Jiawen Zhang and Pan Guo*



REVIEWS

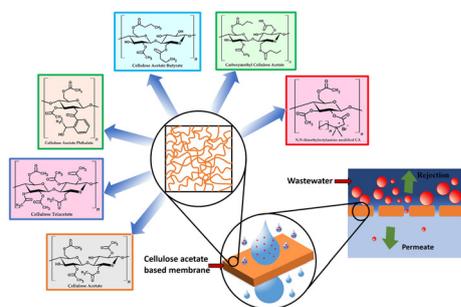
4041



Advances of nanoworms in diagnosis, treatment, and theranostics

Kadambari Borse and Pravin Shende*

4054

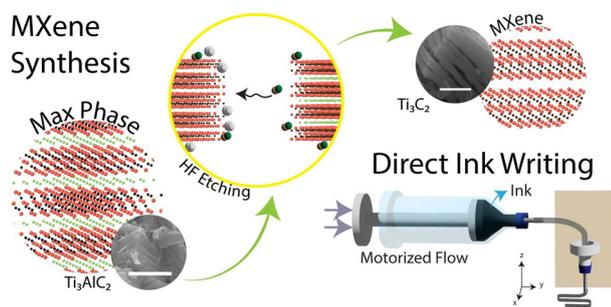


Cellulose acetate-based membrane for wastewater treatment—A state-of-the-art review

Md. Didarul Islam, Foyez Jalal Uddin, Taslim Ur Rashid* and Mohammad Shahruzzaman*

COMMUNICATION

4103

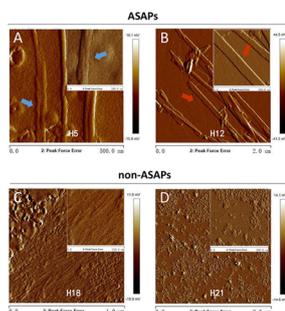


3D printing aqueous $Ti_3C_2T_x$ inks for MXene-based energy devices

Mofetoluwa Fagade, Dhanush Patil, Sri Vaishnavi Thummalappalli, Sayli Jambhulkar, Dharneedar Ravichandran, Arunachala M. Kannan and Kenan Song*

PAPERS

4110



The morphology and structural features of self-aggregating hexapeptides with antibiofilm formation activity

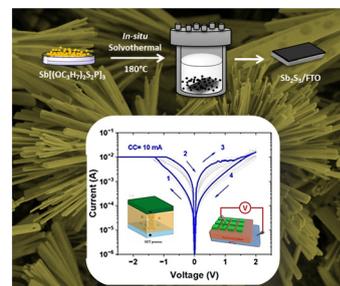
Dongru Chen, Tingyu Wang, Yiyi Huang, Yucong Chen, Huancai Lin* and Liping Wu*



4119

Solution-based *in situ* deposition of Sb_2S_3 from a single source precursor for resistive random-access memory devices

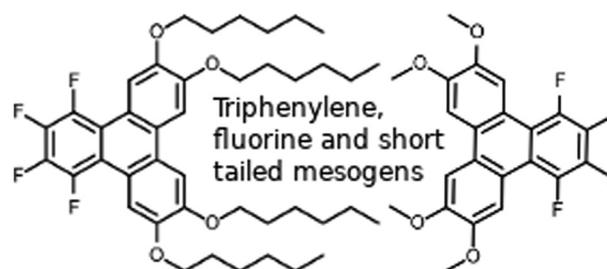
Sayali Shrishail Harke, Tongjun Zhang, Ruomeng Huang and Chitra Gurnani*



4129

Vanishing tails and a resilient mesophase: columnar liquid crystals in the limit of short tails

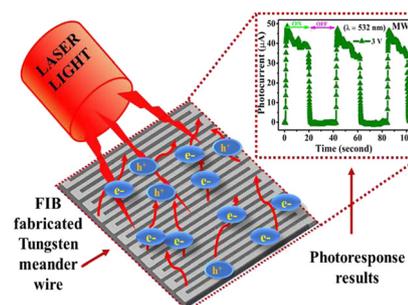
Parikshit Guragain,* Mitchell Powers, John Portman, Brett Ellman and Robert J. Twieg



4138

Room-temperature photoconductivity in superconducting tungsten meander wires

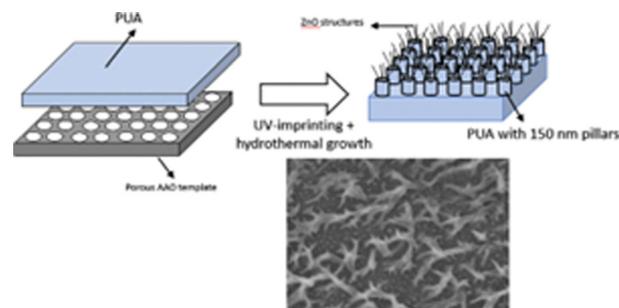
Abhishek Kumar, Alka Sharma, Animesh Pandey, M. P. Saravanan and Sudhir Husale*



4151

Antibacterial surface based on hierarchical polyurethane acrylate/zinc oxide structures

Sruthi Venugopal Oopath, Akesh Babu Kakarla, Ing Kong, Thanh Tien Nguyen, Vi Khanh Truong* and Avinash Baji*



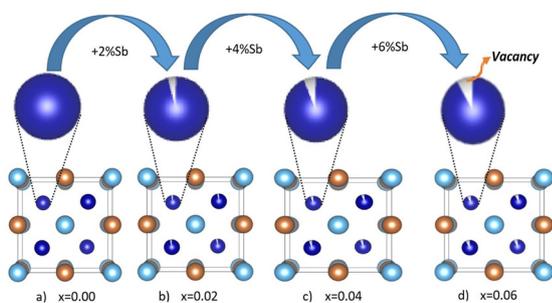
4159



Unveiling the capability of graphitic carbon nitride–rhenium disulfide nanocomposite as an electrochemical sensing platform for the detection of dimetridazole from human serum samples

M. Mufeeda, Pushpalatha V. Vaishag, Menon Ankitha and P. Abdul Rasheed*

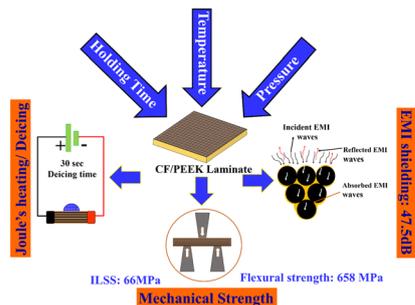
4168



Transport phenomena of TiCoSb: defect induced modification in the structure and density of states

S. Mahakal, Diptasikha Das, Pintu Singha, Aritra Banerjee, S. C. Das, Santanu K. Maiti, S. Assa Aravindh and K. Malik*

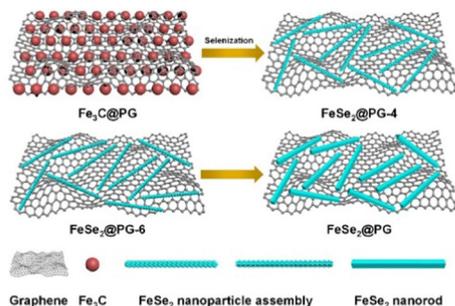
4180



Process dependent interface strengthening, de-icing and EMI shielding performance in PEEK/CF laminates

Rishi Raj, Sampath Parasuram, S. Kumar and Suryasarathi Bose*

4190



Confined oriented growth of FeSe₂ on a porous graphene film as a binder-free anode for high-rate lithium-ion batteries

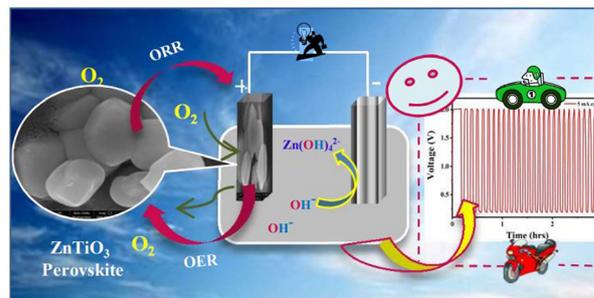
Xiaoting Zhang, Jiaxiu Diao, Jinghao Qiao, Yuhui Wen, Hongkun Zhang* and Rui Wang*



4197

Investigation of the cycling stability and energy storage properties of zinc titanate (ZnTiO₃) perovskite material for zinc–air batteries

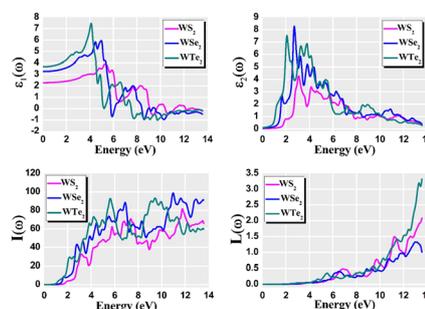
Upasana Bhardwaj, Aditi Sharma and H. S. Kushwaha*



4204

A first-principles study of the electronic, optical, and transport properties of novel transition-metal dichalcogenides

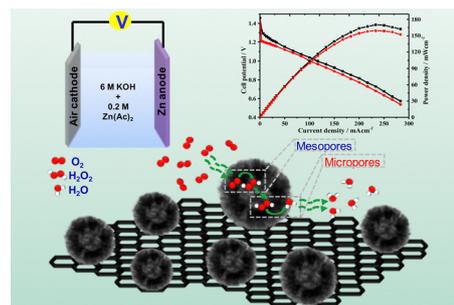
Banat Gul, Muhammad Salman Khan, Bashir Ahmad, Mostafizur Rahaman, Paride O. Lolika,* Guenez Wafa and Hijaz Ahmad



4216

Dendritic hollow nitrogen-doped carbon nanospheres for oxygen reduction at primary zinc–air batteries

J. Anjana, Anook Nazer Eledath and Azhagumuthu Muthukrishnan*



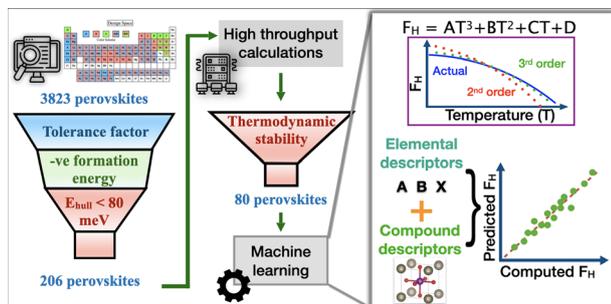
4226

A database to select affordable MOFs for volumetric hydrogen cryoadsorption considering the cost of their linkers

Jose A. Villajos,* Martin Bienert, Nikita Gugin, Franziska Emmerling and Michael Maiwald



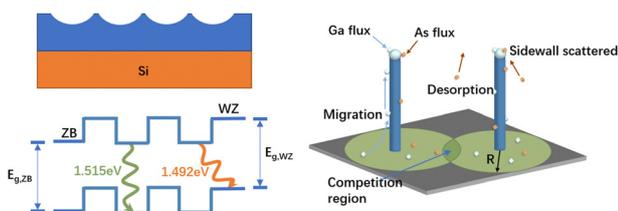
4238



Machine learning the vibrational free energy of perovskites

Krishnaraj Kundavu, Suman Mondal and Amrita Bhattacharya*

4250



Crystal phase control in self-catalyzed GaAs nanowires grown on pre-etched Si substrates

Shan Wang, Haolin Li, Jilong Tang, Yubin Kang, Xiaohua Wang,* Rui Chen* and Zhipeng Wei*

