

Materials Advances

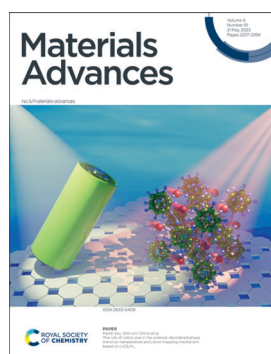
An open access journal publishing across the breadth of materials science

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(10) 2237–2394 (2023)



Cover

See Kartik Sau,
Shin-ichi Orimo *et al.*,
pp. 2269–2280.
Image reproduced
by permission of
Kartik Sau from
Mater. Adv.,
2023, 4, 2269.

EDITORIAL

2245

Introduction to biomass materials

Meisha L. Shofner* and Andrew G. Tennyson*

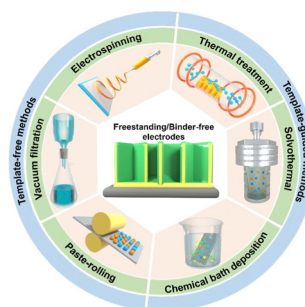


REVIEW

2247

Rational fabrication strategies of freestanding/binder-free electrodes for efficient capacitive deionization

Zhibo Zhao, Fangqiao Wang, Baobao Li, Zhuomin Chen,
Hao Zhou, Xiaoru Wen* and Meidan Ye*



Editorial Staff

Executive Editor

Jeremy Allen

Deputy Editor

Hannah Kerr

Editorial Production Manager

Christopher Goodall

Assistant Editors

Zita Zachariah and Serra Arslançan Sengelen

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 0WF.

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 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

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
Jiang Chang, Shanghai Institute of Ceramics, China
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
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 Jurcescu, 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
Marc in het Panhuis, University of

Wollongong, Australia
Shizhang Qiao, University of Adelaide, Australia
Erin Ratcliff, University of Arizona, USA
Neil Robertson, University of Edinburgh, UK
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
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
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

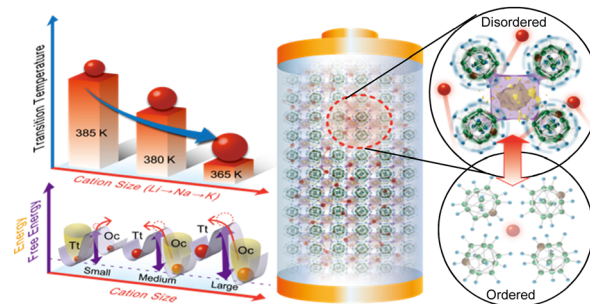


PAPERS

2269

The role of cation size in the ordered–disordered phase transition temperature and cation hopping mechanism based on $\text{LiCB}_{11}\text{H}_{12}$

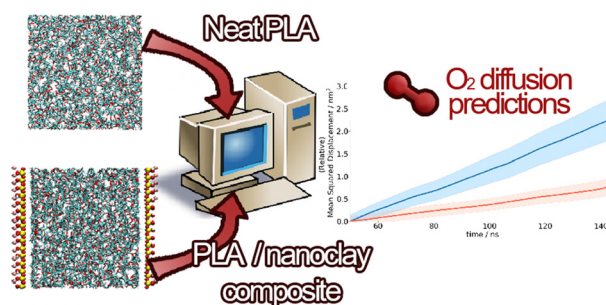
Kartik Sau,* Shigeyuki Takagi, Tamio Ikeshoji, Kazuaki Kisu, Ryuhei Sato and Shin-ichi Orimo*



2281

A molecular dynamics approach to modelling oxygen diffusion in PLA and PLA clay nanocomposites

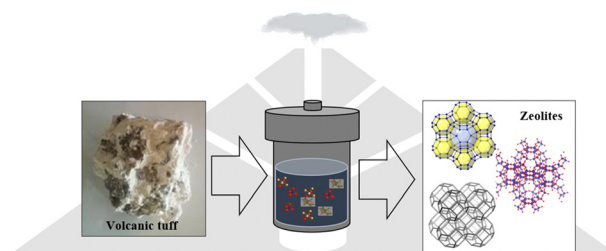
J. C. Lightfoot,* B. Castro-Dominguez, A. Buchard and S. C. Parker*



2292

Hydrothermal synthesis of zeolites using silica extracted from tropical volcanic ash

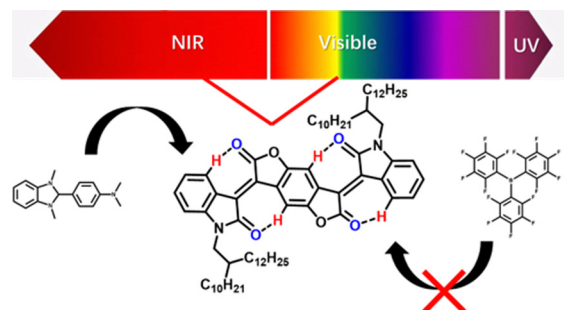
Stephen O. Otieno, Fredrick O. Kengara, Chrispin O. Kowenje* and Robert Mokaya*



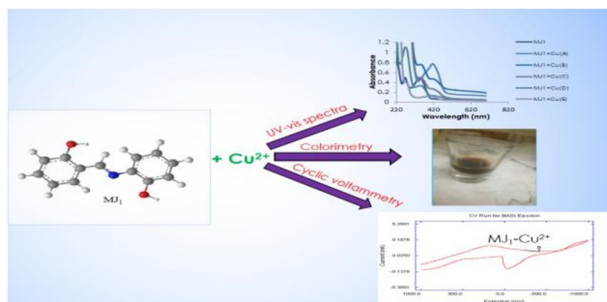
2301

Aldol condensation-polymerized semiconducting polymers based on a BDOPV unit with near infrared absorption and better n-doped ability

Li Tian,* Airong Wang, Haowei Lin, Wenxi Cheng, Mengya Shang, Shanhong Xu and Xuefei Zhou



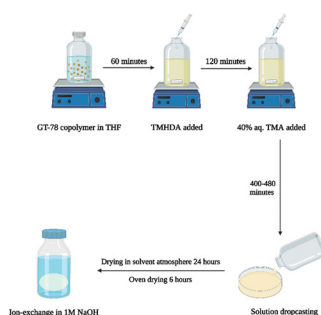
2308



Schiff bases as analytical tools: synthesis, chemo-sensor, and computational studies of 2-aminophenol Schiff bases

Felicia Ndidi Ejiah,* Mujeeb Olarewaju Rofiu, Oluwakemi Adekunbi Oloba-Whenu and Tolulope Mojisola Fasina

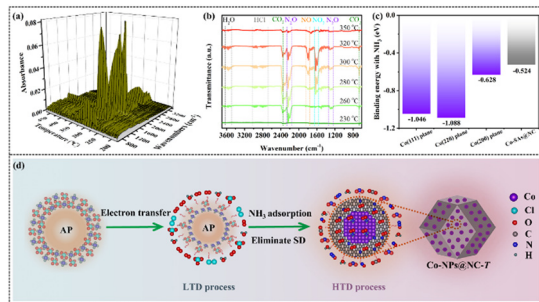
2322



In situ amination of anion conducting solid polymer electrolyte membranes

Parin N. Shah, Habin Park, Hui Min Tee, Chandler Dietrich and Paul A. Kohl*

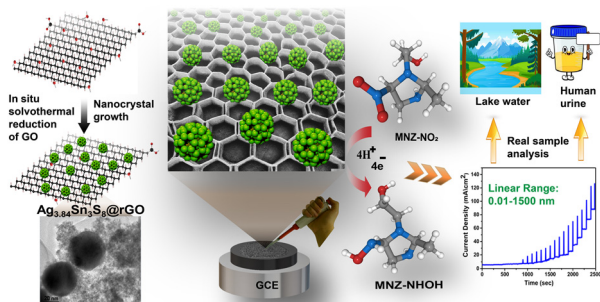
2332



Understanding the synergistically enhanced thermocatalytic decomposition of ammonium perchlorate using cobalt nanoparticle-embedded nitrogen-doped graphitized carbon

Hong Lin, Qingchun Zhang,* Huiyu Liu, Shiyong Shen,* Zhiliang Guo, Bo Jin* and Rufang Peng

2340



In situ fabrication and design of a novel electrochemical sensor based on the $\text{Ag}_{3.84}\text{Sn}_3\text{S}_8@\text{rGO}$ nanocomposite for competitive ultra-detection of metronidazole in human urine

Jit Satra, Papri Mondal, Gopala Ram Bhadu and Bibhutoh Adhikary*

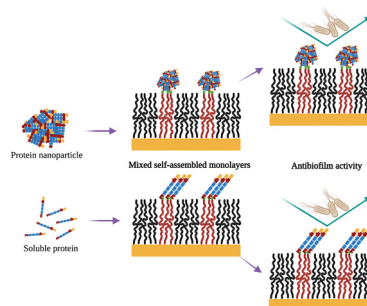


PAPERS

2354

Antibiofilm surfaces based on the immobilization of a novel recombinant antimicrobial multidomain protein using self-assembled monolayers

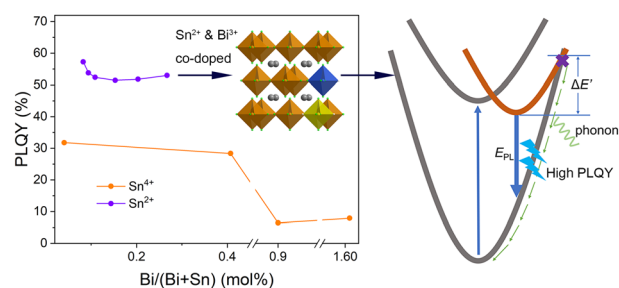
Adriana R. Kyvik, Ramon Roca-Pinilla, Karla Mayolo-Deloisa, Xavier Rodriguez Rodriguez, Marc Martinez-Miguel, Marta Martos, Mariana Köber, Nora Ventosa, Jaume Veciana, Judith Guasch, Elena Garcia-Fruitós, Anna Arís and Imma Ratera*



2365

Sn²⁺ doping-induced large extra vibrational energy of an excited state for efficient blue emission in Cs₂SnCl₆:Bi

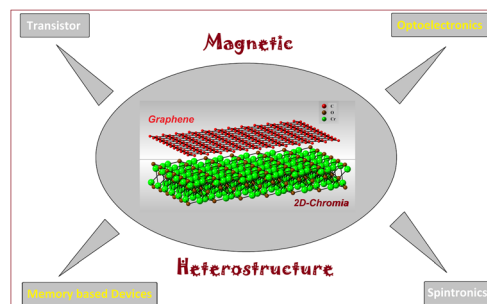
Shaofan Fang,* Jinbo Huang, Huixia Li, Jingheng Nie, Zexiang Liu, Feier Fang and Haizhe Zhong*



2372

Signature of magnetism in 2D-chromia: 2D analog of the natural α -Cr₂O₃ mineral and its heterostructure with graphene

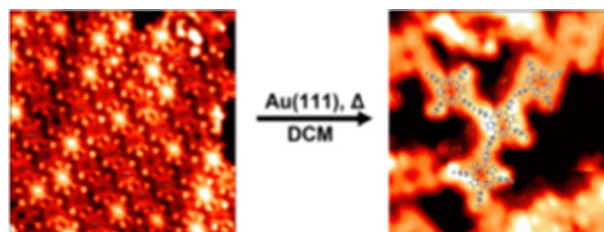
Renu Singla, Rahul Singla, Sarvesh Kumar, Timothy A. Hackett and Manish K. Kashyap*



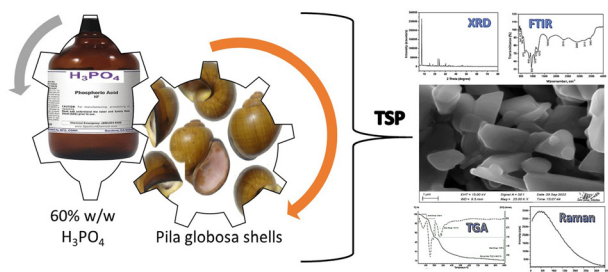
2379

Synthesis of extended covalently bound porphyrins on the Au(111) surface

José J. Ortiz-García* and Rebecca C. Quardokus



2384



Synthesis and characterization of nano-crystallite triple superphosphate from waste *Pila globosa* shells for sustainable industrial production

Md. Sahadat Hossain, Md. Aftab Ali Shaikh,*
Md. Farid Ahmed and Samina Ahmed*

