

Materials Advances

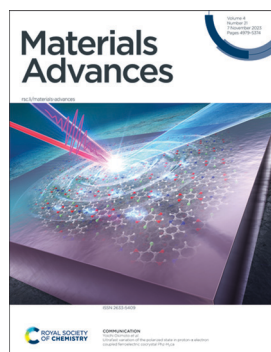
An open access journal publishing across the breadth of materials science

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.

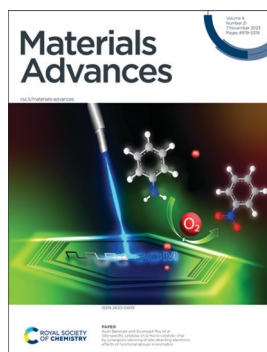
IN THIS ISSUE

ISSN 2633-5409 CODEN MAADC9 4(21) 4979–5374 (2023)



Cover

See Yoichi Okimoto *et al.*, pp. 5126–5130. Image reproduced by permission of Yoichi Okimoto from *Mater. Adv.*, 2023, 4, 5126.



Inside cover

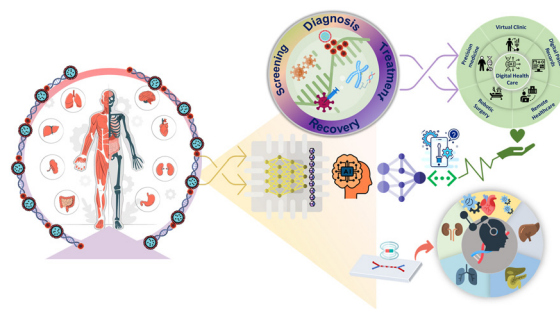
See Ayan Banerjee and Soumyajit Roy *et al.*, pp. 5131–5139. Image reproduced by permission of Soumyajit Roy (image credit: Nidhi Kumari) from *Mater. Adv.*, 2023, 4, 5131.

PERSPECTIVE

4991

Perspective of point-of-care sensing systems in cancer management

Kamil Reza Khondakar,* M. S. Anwar, Hirak Mazumdar and Ajeet Kaushik

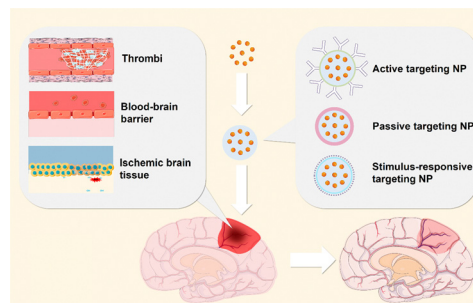


REVIEWS

5003

Recent advances in targeted nanoparticle drug delivery systems for ischaemic stroke

Xiaojun Li, Qi Wang, Qi Fang, Jianling Xu, Baosong Han, Yongquan Chen, Weidong Yao,* Sheng Ye* and Bin Wang*



Editorial Staff

Executive Editor

Jeremy Allen

Deputy Editor

Hannah Kerr

Editorial Production Manager

Daniella Ferluccio

Assistant Editors

Zita Zachariah, Serra Arslançan Sengelen and Zifei Lu

Editorial Assistant

Rosie Hague

Publishing Assistant

Allison Holloway

Publisher

Neil Hammond

For queries about submitted papers, please contact Daniella Ferluccio, 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
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, Technical Institute of Physics and Chemistry, 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

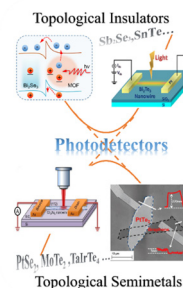


REVIEWS

5018

Research progress on topological material-based photodetectors

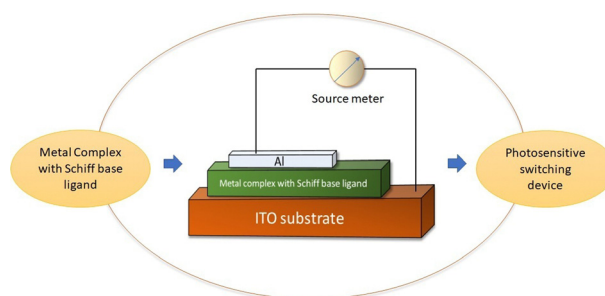
Kewen Wu, Xiaoqi Liao, Muhammad Ahsan Iqbal and Yu-Jia Zeng*



5033

Development of electrical conductivity-based photosensitive switching devices using metal complexes with Schiff base ligands

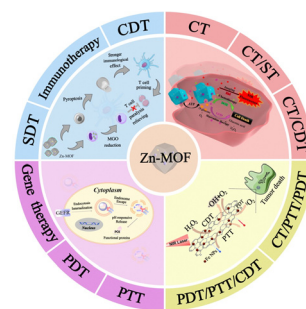
Shibashis Halder



5050

Recent advances in Zn-MOFs and their derivatives for cancer therapeutic applications

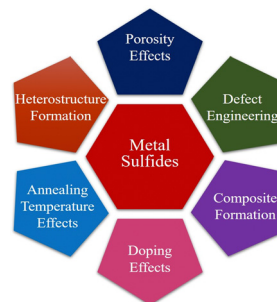
Minmin Li, Zhixin Zhang, Yamei Yu, Hui Yuan,*
Alireza Nezamzadeh-Ejhi, Jianqiang Liu,*
Ying Pan and Qian Lan*



5094

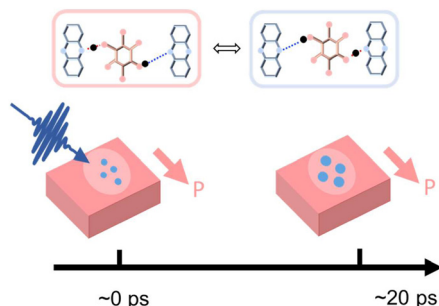
Response surface methodology: a powerful tool for optimizing the synthesis of metal sulfide nanoparticles for dye degradation

Zeshan Ali Sandhu,* Muhammad Asam Raza,
Umme Farwa, Samia Nasr, Ibrahim Sayed Yahia,
Seerat Fatima, Mehmuna Munawar, Yousra Hadayet,
Sufyan Ashraf and Haseeb Ashraf



COMMUNICATION

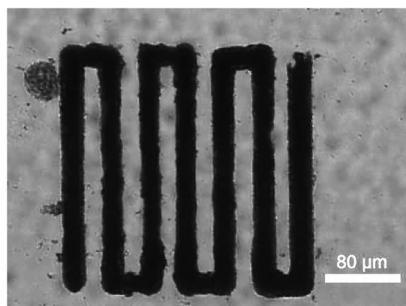
5126

Ultrafast variation of the polarized state in proton- π electron coupled ferroelectric cocrystal Phz-H₂ca

Akihiro Sugisawa, Tsugumi Umanodan, Hongwu Yu, Tadahiko Ishikawa, Shin-ya Koshihara, Sachio Horiuchi and Yoichi Okimoto*

PAPERS

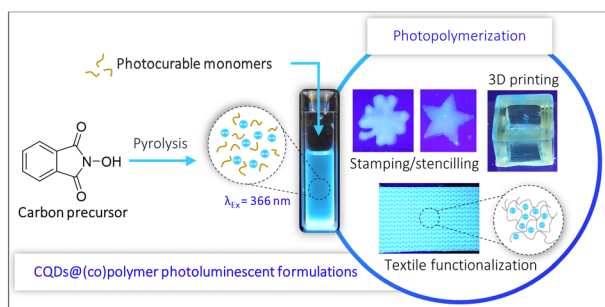
5131



Site-specific catalysis on a micro-catalytic chip by synergistic silencing of site-directing electronic effects of functional groups in aromatics

Rakesh Sen, Kousik Das, Subhrokolli Ghosh, Anand Dev Ranjan, Khokan Manna, Ayan Banerjee* and Soumyajit Roy*

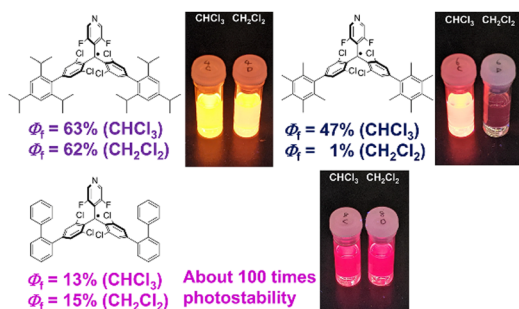
5140



Photoinduced polymer-confined CQDs for efficient photoluminescent 2D/3D printing applications

Jessica Plé, Corneliu S. Stan, Didier Zanghi, Cécile Genevois, Samar Hajjar-Garreau and Lavinia Balan*

5149



Effects of hydrocarbon substituents on highly fluorescent bis(4-phenylphenyl)pyridylmethyl radical derivatives

Yohei Hattori,* Ryota Kitajima, Atsumi Baba, Kohei Yamamoto, Ryota Matsuoka, Tetsuro Kusamoto and Kingo Uchida

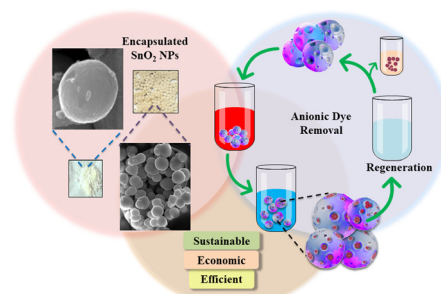


PAPERS

5160

Fabrication of highly efficient encapsulated SnO_2 @alginate beads as regenerative nanosorbents for anionic dye pollutants removal from aqueous solution

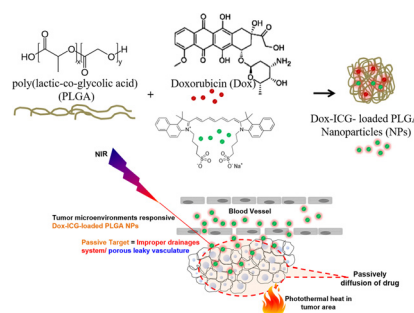
Shikha Jyoti Borah, Akanksha Gupta,
Kashyap Kumar Dubey and Vinod Kumar*



5175

NIR-light-triggered delivery of doxorubicin-loaded PLGA nanoparticles for synergistic cancer therapy on DMBA/TPA induced tumor-bearing mice

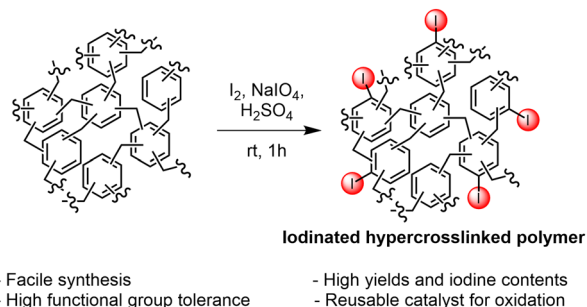
Tunazzina Zaman Khan, Shekh Md Newaj,
Ashikur Rahman, Rahnuma Tabassum,
Khandaker Nujhat Tasnim, Hasan Mahmud Reza,
Md. Selim Reza, Seonki Hong and Shazid Md. Sharker*



5184

A facile synthesis of iodine-functionalized hypercrosslinked polymers

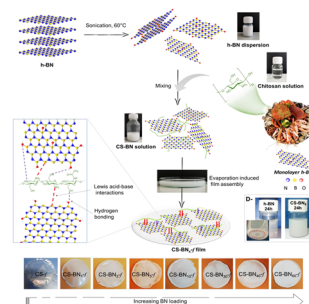
Chanachon Thiamsiri, Thanchanok Ratvijitvech and
Torsak Luanphaisarnnont*



5191

Boron nitride embedded in chitosan hydrogel as a hydrophobic, promising metal-free, sustainable antibacterial material

Nisrine Hammi, Marta Kędzierska, Natalia Wrońska,
Nadia Katir, Jeremy Dhainaut, Sebastien Royer,
Katarzyna Lisowska, Maria Bryszewska,
Katarzyna Miłowska and Abdelkrim El Kadib*



PAPERS

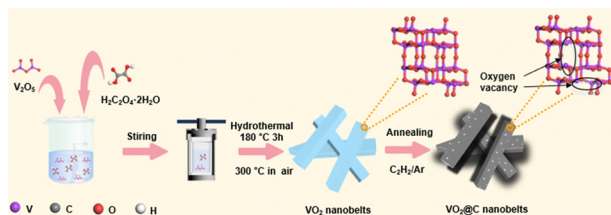
5200



From waste to energy: luminescent solar concentrators based on carbon dots derived from surgical facemasks

Antonino Arrigo,* Ambra M. Cancelliere, Maurilio Galletta, Antonio Burtone, Giovanni Lanteri, Francesco Nastasi* and Fausto Puntoriero

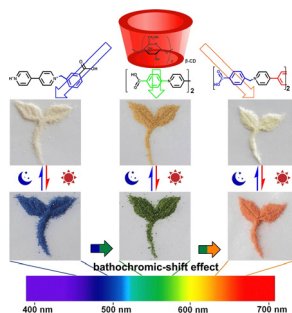
5206



Synergistic carbon and oxygen vacancy engineering on vanadium dioxide nanobelts for efficient aqueous zinc-ion batteries

Xin Gu,* Juntao Wang, Shuang Wu, Sijin Dong, Fengchun Li, Akang Cui, Mengdi Zhang, Pengcheng Dai* and Mingbo Wu*

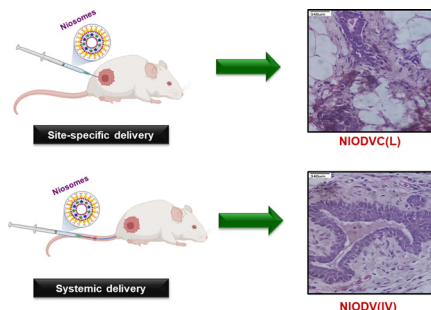
5215



Supramolecular inclusion complexes of β -cyclodextrin with bathochromic-shifted photochromism and photomodulable fluorescence enable multiple applications

Dong-Xue Xia, Li-Wen Fan, Ming-Fu Ye, Wen-Qi Sun,* Rui-Lian Lin and Jing-Xin Liu*

5224



Epidermal growth factor receptor targeted doxorubicin and vitexin loaded niosomes for enhanced breast cancer therapy

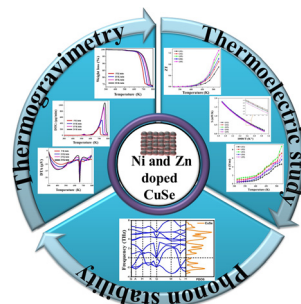
S. Malathi, Valappil Sisila, V. Singaravel, Nandakumar Venkatesan, Iqbal Pakrudheen, R. Dhanaraj, Niraikulam Ayyadurai, V. Bhuvaramurthy and S. Narayana Kalkura*



5238

The impact of Ni and Zn doping on the thermal durability and thermoelectric variables of pristine CuSe nanoparticles

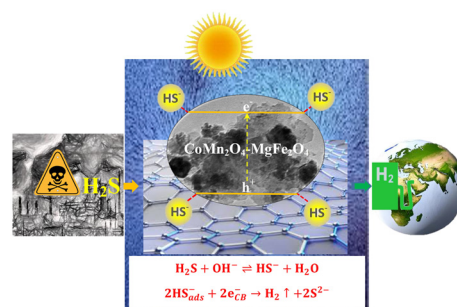
Sefali R. Patel,* Sunil H. Chaki,* Mitesh B. Solanki, Rohitkumar M. Kannaujiya, Zubin R. Parekh, Ankurkumar J. Khimani and Milind P. Deshpande



5252

A novel magnetic HS⁻-adsorptive nanocomposite photocatalyst (rGO/CoMn₂O₄-MgFe₂O₄) for hydrogen fuel production using H₂S feed

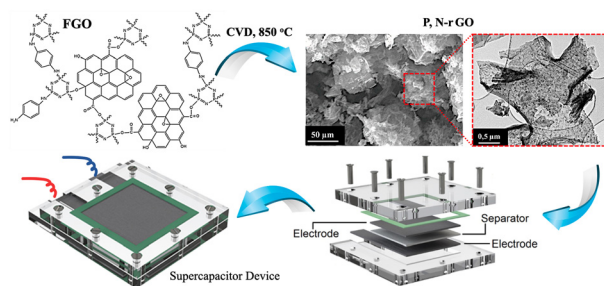
Majid Ghanimati, Mohsen Lashgari,* Fabio Montagnaro, Vassilios Binas, Michalis Konsolakis and Marco Balsamo



5263

Phosphorus and nitrogen co-doped reduced graphene oxide as superior electrode nanomaterials for supercapacitors

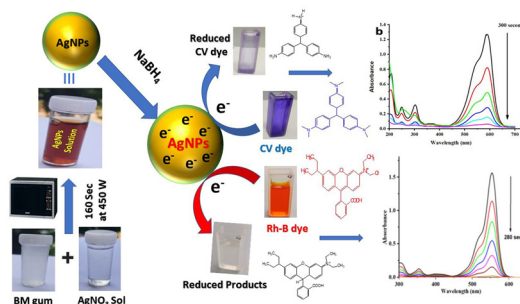
Khaled Rhili, Siham Chergui, Juan Carlos Abergo-Martinez, Ahmad Samih El Douhaibi and Mohamed Siaj*



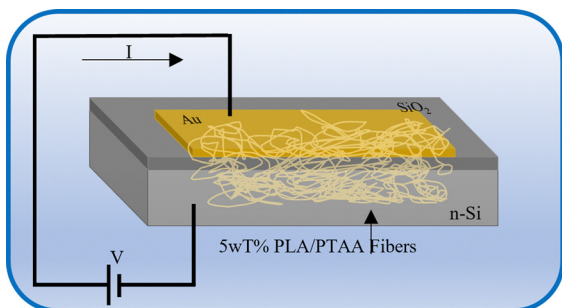
5273

Green synthesis of *Mesona Blumes* gum capped silver nanoparticles and their antioxidant, antibacterial and catalytic studies

Walaa Abdullah Sulaiman Al Yahyai, Aya Ali Sulaiman Al Isai, Mohammed F Alotibi, Bhagavanth Reddy G, Mohammed Al-Abri, Babu Pejjai, Nagaraju Devunuri, Nadavala Siva Kumar, Ahmed S. Al-Fatesh, Ahmed I. Osman* and Kondaiah Seku*



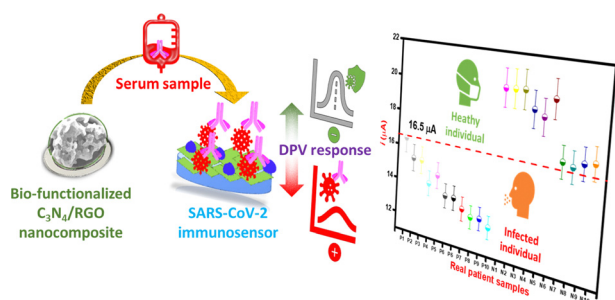
5282



Electro-spun poly(lactic acid)/poly(triarylamine)(PLA/PTAA) composite nanofibers with low PLA content for fiber-based electronic applications

Alejandro J. Cruz-Arzón, Nitza V. Falcón-Cruz, William Serrano-García, Nicholas J. Pinto* and Rolando Oyola*

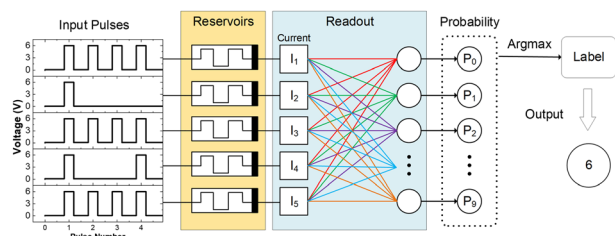
5291



Detection of specific antibodies against SARS-CoV-2 spike protein via ultra-sensitive bio-functionalized carbonnitride-reduced graphene oxide electrochemical immunosensing platform in real samples

Mohd. Abubakar Sadique, Shalu Yadav, Pushpesh Ranjan, Raghuraj Singh Chouhan,* Ivan Jerman, Ashok Kumar, Saurabh Saigal, Sagar Khadanga, Raju Khan* and Avanish K. Srivastava

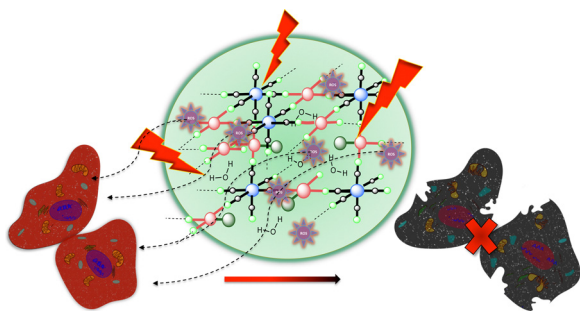
5305



Reservoir computing using back-end-of-line SiC-based memristors

Dongkai Guo, Omesh Kapur, Peng Dai, Yisong Han, Richard Beanland, Liudi Jiang, C. H. (Kees) de Groot and Ruomeng Huang*

5314



Ultra-small platinum-based coordination nanoparticles for radiotherapy

Riya George,* Lucile Fétiveau, Erika Porcel,* Farah Savina, Charles Bosson Bapaume, Diana Dragoe, François Brisset, Hynd Remita, Sandrine Lacombe and Laure Catala*

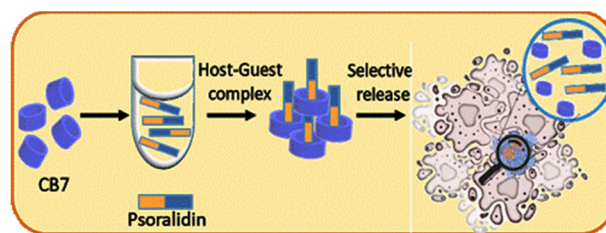


PAPERS

5324

Psoralidin–cucurbit[7]uril complex with improved solubility to tackle human colorectal cancer: experimental and computational study

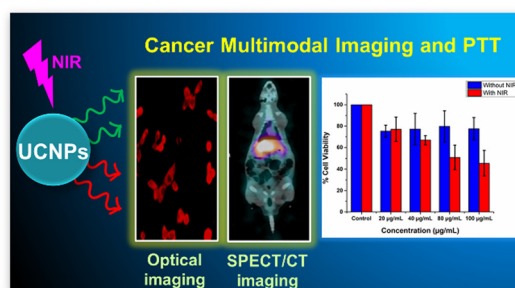
Fortuna Ponte, Nada K. Sedky, Iten M. Fawzy, Fatma Mokhtar, Emilia Sicilia* and Sherif Ashraf Fahmy*



5338

Remarkably enhanced upconversion luminescence in Na⁺ codoped spinel nanoparticles for photothermal cancer therapy and SPECT imaging

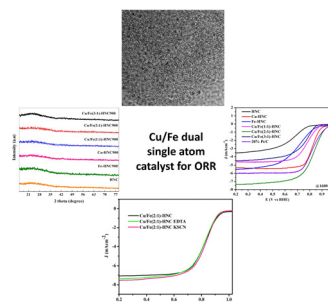
Annu Balhara, Santosh K. Gupta,* Nidhi Aggarwal, Swapnil Srivastava, Jiban Jyoti Panda,* Sourav Patra, Avik Chakraborty, Sutapa Rakshit and Rubel Chakravarty



5353

Cu/Fe embedded N-doped carbon as a highly durable oxygen reduction electrocatalyst

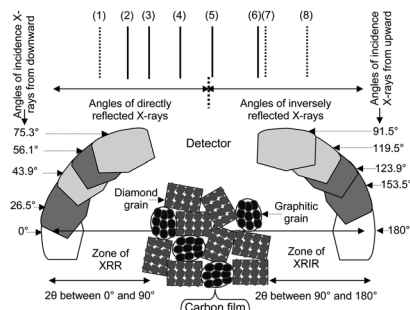
Banafsha Habib, Shaowei Chen, Forrest Nichols, Shamraiz Hussain Talib, Nasima Arshad, Anham Zafar, Arshad Mahmood, Shahid Zaman* and Naveed Kausar Janjua*



5361

Structural analyses of carbon films deposited at different total mass rates in a hot-filament CVD system

Mubarak Ali



CORRECTION

5371

Correction: Impact of thermal gas treatment on the surface modification of Li-rich Mn-based cathode materials for Li-ion batteries

Maximilian Mellin, Zhili Liang, Hadar Sclar, Sandipan Maiti, Igor Piš, Silvia Nappini, Elena Magnano, Federica Bondino, Ilargi Napal, Robert Winkler, René Hausbrand, Jan P. Hofmann, Lambert Alff, Boris Markovsky, Doron Aurbach, Wolfram Jaegermann and Gennady Cherkashinin*

