

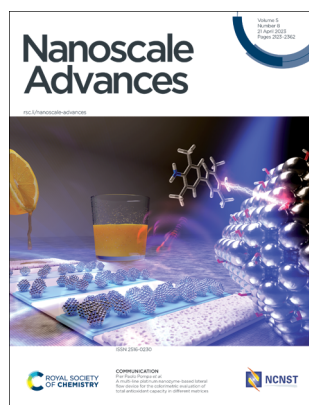
Nanoscale Advances

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(8) 2123–2362 (2023)



Cover

See Pier Paolo Pompa *et al.*, pp. 2167–2174. Image reproduced by permission of Pier Paolo Pompa from *Nanoscale Adv.*, 2023, 5, 2167.



Inside cover

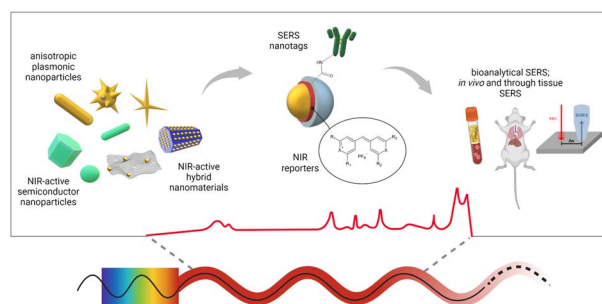
See John X. J. Zhang *et al.*, pp. 2180–2189. Image reproduced by permission of John X. J. Zhang from *Nanoscale Adv.*, 2023, 5, 2180.

REVIEW

2132

Challenges and opportunities for SERS in the infrared: materials and methods

Chiara Deriu,* Shaila Thakur, Olimpia Tammaro and Laura Fabris

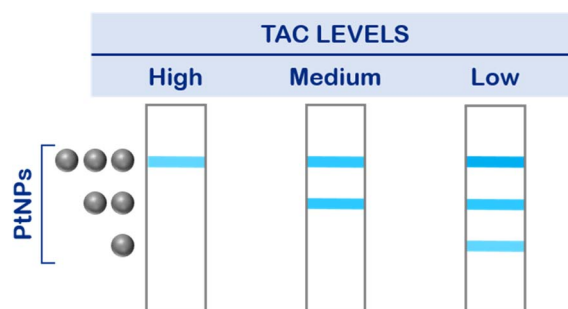


COMMUNICATIONS

2167

A multi-line platinum nanozyme-based lateral flow device for the colorimetric evaluation of total antioxidant capacity in different matrices

Anna Scarsi, Deborah Pedone and Pier Paolo Pompa*



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 Arslançan Sengelen

Publisher

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 0WE.

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 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

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 Guld, Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany

Associate Editors

Cinzia Casiraghi, University of Manchester, UK
Gianurelio (Giovanni) Cuniberti, TU Dresden, Germany

Qing Dai, National Center for Nanoscience and Technology of China, China

Yves Dufrene, Université Catholique de Louvain, Belgium

Andrea Ferrari, University of Cambridge, UK

Dong Ha Kim, Ewha Womans University, Korea

Christian Klink, University of Rostock, Germany

Germany

Quan Li, The Chinese University of Hong Kong, Hong Kong

Zhiqun Lin, National University of Singapore, Singapore

Xing Yi Ling, Nanyang Technological University, Singapore

Xiaogang Liu, National University of Singapore, Singapore

Renzhi Ma, National Institute for Materials Science, Japan

Janet Macdonald, Vanderbilt University, USA

Teresa Pellegrino, Istituto Italiano di Tecnologia, Italy

Dong Qin, Georgia Institute of Technology, USA

Elena Shevchenko, Argonne National Laboratory, USA

Jonathan Veinot, University of Alberta, Canada

Umesh Waghmare, JNCASR, India

Jinlan Wang, Southeast University, 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

Jingyi 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, University 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

Kouros 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, Istituto 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 Qin, 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

Ventsislav Valev, University of Bath, UK

Miriam Vitiello, CNR Nanotec, Italy

Jianfang Wang, Chinese University of Hong Kong, Hong Kong SAR

Benjamin Wiley, Duke University, USA

Xiaojuan 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, China

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, China

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

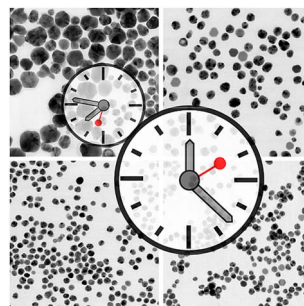


COMMUNICATIONS

2175

Time-domain Tollens reaction: synthesising silver nanoparticles with the formaldehyde clock

Ronny Kürsteiner, Maximilian Ritter, Alla Sologubenko, Laura Stricker and Guido Panzarasa*

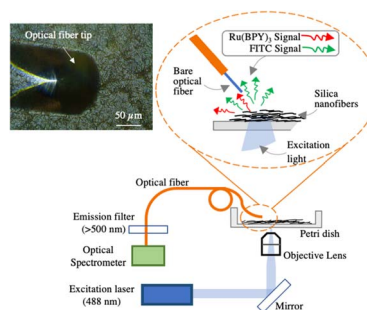


PAPERS

2180

Dual fluorescent hollow silica nanofibers for *in situ* pH monitoring using an optical fiber

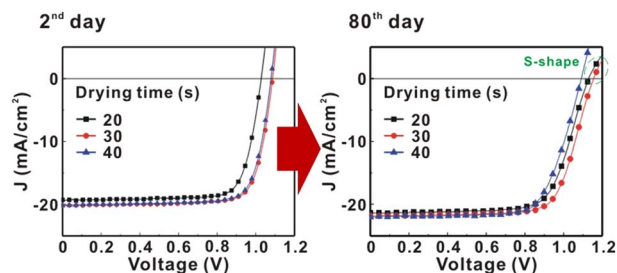
Junhu Zhou, Yundong Ren, Yuan Nie, Congran Jin, Jiyeon Park and John X. J. Zhang*



2190

Effects of drying time on the formation of merged and soft MAPbI₃ grains and their photovoltaic responses

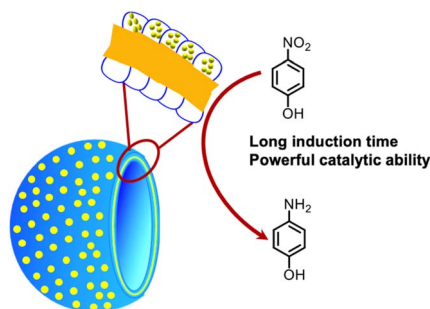
Anjali Chandel, Qi Bin Ke, Shou-En Chiang, Hsin-Ming Cheng* and Sheng Hsiung Chang*



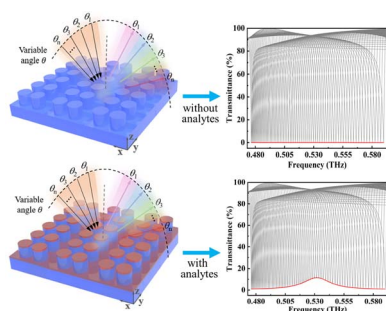
2199

Generation of sub-5 nm AuNPs in the special space of the loop-cluster corona of a polymer vesicle: preparation and its unique catalytic performance in the reduction of 4-nitrophenol

Wen-Li Wang, Ayaka Kanno, Amika Ishiguri and Ren-Hua Jin*



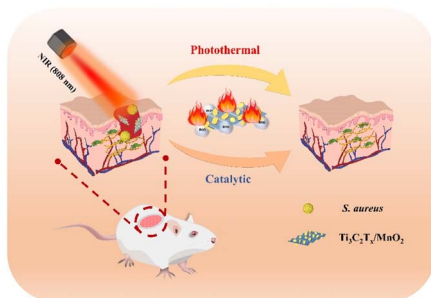
2210



A terahertz metasurface sensor with fingerprint enhancement in a wide spectrum band for thin film detection

Xuan Zhang, Jianjun Liu and Jianyuan Qin*

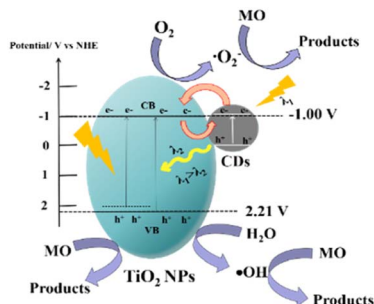
2216



Synthesis of $\text{Ti}_3\text{C}_2\text{T}_x/\text{MnO}_2$ composites for synergistic catalytic/photothermal-based bacterial inhibition

Ting Hu, Zhilong Xu, Peiying Zhang, Lei Fan,* Juqun Xi,* Jie Han and Rong Guo

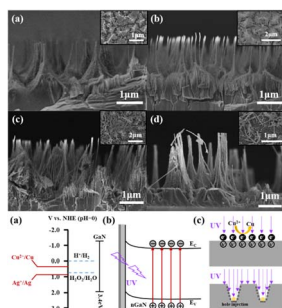
2226



Kilogram-scale fabrication of TiO_2 nanoparticles modified with carbon dots with enhanced visible-light photocatalytic activity

Jingjing Xu, Jiayan Zhang, Feifei Tao,* Pengfei Liang and Pingan Zhang

2238



GaN nanowires prepared by Cu-assisted photoelectron-chemical etching

Qi Wang,* Wen Yang, Sheng Gao, Weizhong Chen, Xiaosheng Tang, Hongsheng Zhang, Bin Liu, Genquan Han and Yi Huang*

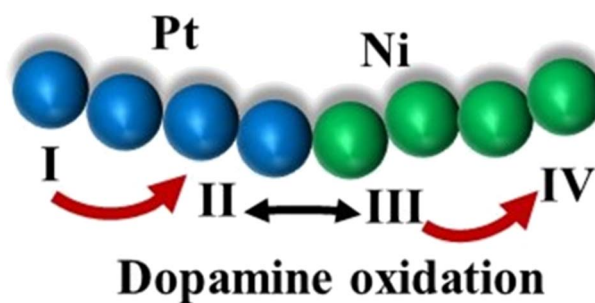


PAPERS

2244

Au–Pt–Ni nanochains as dopamine catalysts: role of elements and their spatial distribution

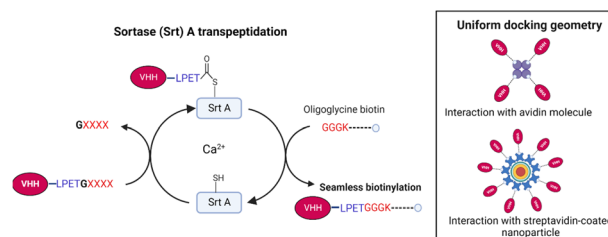
Hua Fan, William Le Boeuf and Vivek Maheshwari*



2251

Sortase A transpeptidation produces seamless, unbranched biotinylated nanobodies for multivalent and multifunctional applications

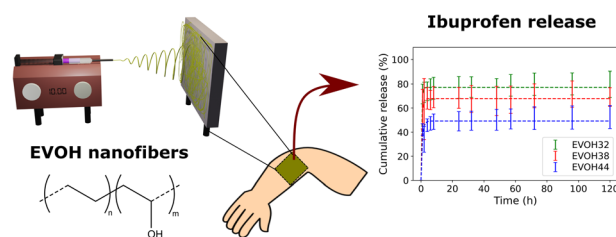
Eugene M. Obeng, David L. Steer, Alex J. Fulcher and Kylie M. Wagstaff*



2261

Ibuprofen-loaded electrospun poly(ethylene-co-vinyl alcohol) nanofibers for wound dressing applications

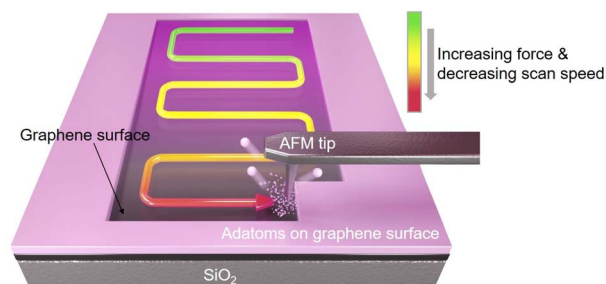
Jean Schoeller, Karin Wuertz-Kozak, Stephen J. Ferguson, Markus Rottmar, Jonathan Avaro, Yvonne Elbs-Glatz, Michael Chung and René M. Rossi*



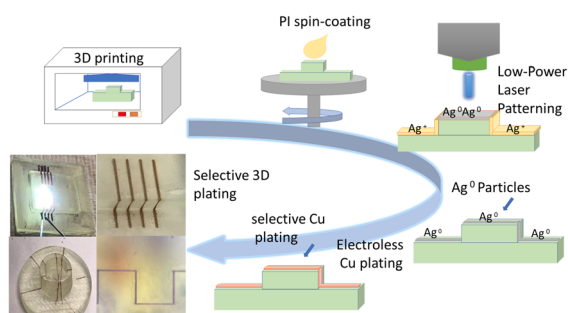
2271

Chemical gradients on graphene *via* direct mechanochemical cleavage of atoms from chemically functionalized graphene surfaces

Hyeonsu Kim, Dong-Hyun Kim, Yunjo Jeong, Dong-Su Lee, Jangyup Son* and Sangmin An*



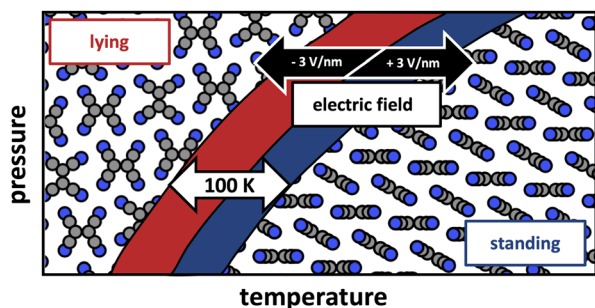
2280



Low-power laser manufacturing of copper tracks on 3D printed geometry using liquid polyimide coating

Mansour Abdulrhman, Adarsh Kaniyoor, Carmen M. Fernández-Posada, Pablo Acosta-Mora, Ian McLean, Nick Weston, Marc P. Y. Desmulliez and Jose Marques-Hueso*

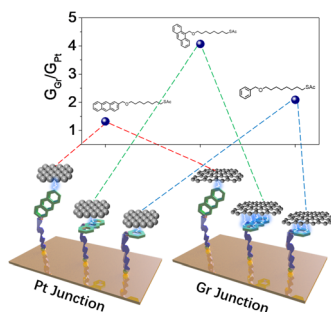
2288



Polymorphism mediated by electric fields: a first principles study on organic/inorganic interfaces

Johannes J. Cartus, Andreas Jeindl, Anna Werkovits, Lukas Hörmann and Oliver T. Hofmann*

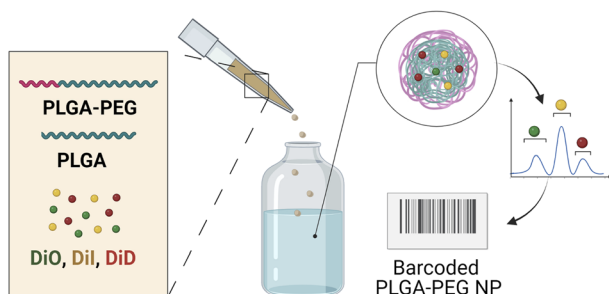
2299



Planar aromatic anchors control the electrical conductance of gold|molecule|graphene junctions

Luke J. O'Driscoll, Michael Jay, Benjamin J. Robinson, Hatef Sadeghi, Xintai Wang, Becky Penhale-Jones, Martin R. Bryce* and Colin J. Lambert*

2307



Identification of fluorescently-barcoded nanoparticles using machine learning

Ana Ortiz-Perez, Cristina Izquierdo-Lozano, Rens Meijers, Francesca Grisoni and Lorenzo Albertazzi*

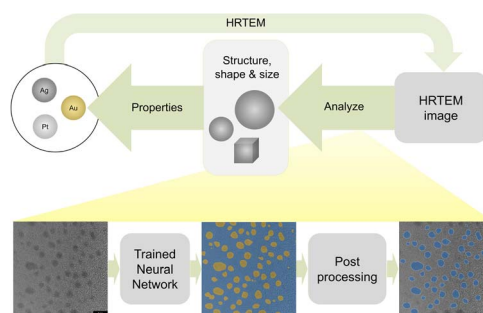


PAPERS

2318

Automated analysis of transmission electron micrographs of metallic nanoparticles by machine learning

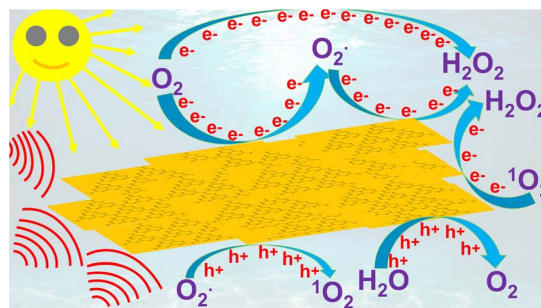
Nina Gumbiowski, Kateryna Loza, Marc Heggen and Matthias Eppe*



2327

Revisiting the roles of dopants in g-C₃N₄ nanostructures for piezo-photocatalytic production of H₂O₂: a case study of selenium and sulfur

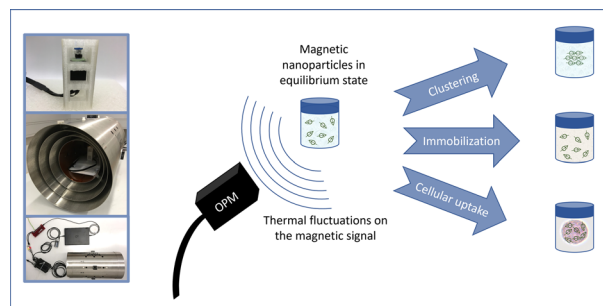
Dat Do Tran, Hoai-Thanh Vuong, Duc-Viet Nguyen, Pho Phuong Ly, Pham Duc Minh Phan, Vu Hoang Khoi, Phong Thanh Mai and Nguyen Huu Hieu*



2341

Monitoring magnetic nanoparticle clustering and immobilization with thermal noise magnetometry using optically pumped magnetometers

Katrijn Everaert,* Tilmann Sander, Rainer Körber, Norbert Löwa, Bartel Van Waeyenberge, Jonathan Leliaert and Frank Wiekhorst



2352

Exploring the untapped catalytic application of a ZnO/CuI/PPy nanocomposite for the green synthesis of biologically active 2,4,5-trisubstituted imidazole scaffolds

Sahil Kohli, Nisha, Garima Rathee, Sunita Hooda* and Ramesh Chandra*

