

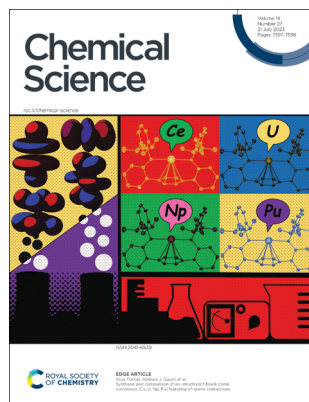
Chemical Science

rsc.li/chemical-science

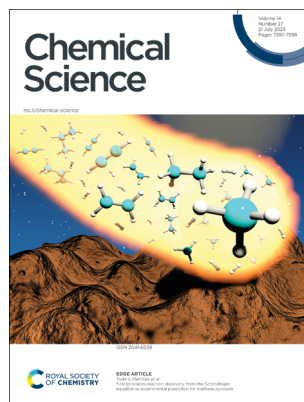
The Royal Society of Chemistry is the world's leading chemistry community. Through our high impact journals and publications we connect the world with the chemical sciences and invest the profits back into the chemistry community.

IN THIS ISSUE

ISSN 2041-6539 CODEN CSHCBM 14(27) 7397–7598 (2023)



Cover
See Skye Fortier, Andrew J. Gaunt *et al.*, pp. 7438–7446.
Image reproduced by permission of Jesse Murillo from *Chem. Sci.*, 2023, 14, 7438.

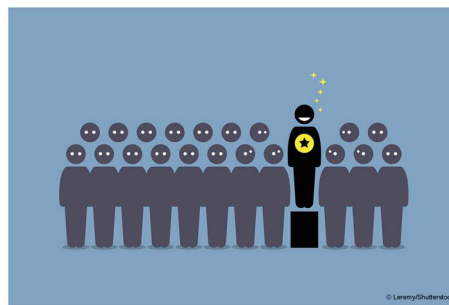


Inside cover
See Todd J. Martinez *et al.*, pp. 7447–7464.
Image reproduced by permission of Rui Xu and Todd J. Martinez from *Chem. Sci.*, 2023, 14, 7447.

EDITORIAL

7406

Outstanding Reviewers for *Chemical Science* in 2022

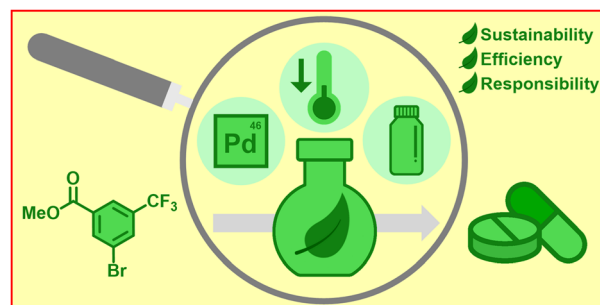


COMMENTARY

7408

A focus on sustainable method development for greener synthesis

Jasper L. Tyler, Felix Katzenburg and Frank Glorius*



Editorial Staff

Executive Editor

May Copsy

Deputy Editor

Samantha Apps

Senior Editor

James Moore

Scientific Editors

Ellis Crawford, Jingtao Huang, Esther Johnston, Sophie Orchard, Richard Thompson and Amy Welch

Editorial Assistant

Karina Webster

Publishing Assistant

David Bishop

For queries about submitted articles please contact James Moore, Senior Editor, in the first instance. E-mail chemicalscience@rsc.org

For pre-submission queries please contact May Copsy, Executive Editor. E-mail chemicalscience-rsc@rsc.org

Chemical Science (electronic: ISSN 2041-6539) is published 48 times a year by the Royal Society of Chemistry, Thomas Graham House, Science Park, Milton Road, Cambridge, CB4 0WF, UK.

Chemical Science is a Gold Open Access journal and all articles from 2015 onwards 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

Chemical Science

rsc.li/chemical-science

Editorial Board

Editor-in-Chief

Andrew Cooper, University of Liverpool

Associate Editors

Vincent Artero, CEA-Grenoble
Luis M. Campos, Columbia University
Michelle Chang, University of California, Berkeley
Lin X. Chen, Northwestern University
Graeme Day, University of Southampton
Serena DeBeer, Max Planck Institute for Chemical Energy Conversion

Mircea Dincă, MIT
François Gabbai, Texas A&M University
Subi George, JNCASR
Jinlong Gong, Tianjin University
Stephen Goldup, University of Birmingham
Zaiping Guo, University of Adelaide
Christopher A. Hunter, University of Cambridge
Malika Jefferies-EL, Boston University
Ning Jiao, Peking University
Tanja Junkers, Monash University
Hemamala Karunadasa, Stanford University

Maja Köhn, University of Freiburg
Yi-Tao Long, Nanjing University
Gabriel Merino, CINVESTAV Merida
James K. McCusker, Michigan State University
Thomas Meade, Northwestern University
Paolo Melchiorre, University of Bologna
Carsten Schultz, Oregon Health & Science University
Dmitri Talapin, The University of Chicago
Toshiharu Teranishi, Kyoto University
Andrei Yudin, University of Toronto

Advisory Board

Dave Adams, University of Glasgow
Ayyappanpillai Ajayaghosh, NIIST
Ulf-Peter Apfel, Ruhr-University Bochum
Polly Arnold, University of California, Berkeley
Xinhe Bao, Dalian Institute of Chemical Physics
Zhenan Bao, Stanford University
Gonçalo Bernardes, University of Cambridge
Frank Biedermann, Karlsruhe Institute of Technology
Donna Blackmond, Scripps Research Institute
Jeffrey Bode, ETH Zurich
Jennifer S. Brodbelt, University of Texas at Austin, USA
Christopher Chang, University of California, Berkeley
Chi-Ming Che, University of Hong Kong
Jun Chen, Nankai University
R. Graham Cooks, Purdue University
Christophe Copéret, ETH Zurich
Eugenio Coronado, University of Valencia
Leroy Cronin, University of Glasgow
James Crowley, University of Otago
Christopher C. Cummins, Massachusetts Institute of Technology
Ben Davis, University of Oxford
Jillann Dempsey, University of North Carolina at Chapel Hill
Kazunari Domen, University of Tokyo
James Durrant, Imperial College London
Xinlang Feng, TU Dresden
Ben Feringa, University of Groningen
Makoto Fujita, University of Tokyo
Phillip Gale, University of Technology Sydney
Song Gao, Peking University
Jeremiah Gassensmith, University of Texas at Dallas
Elizabeth Gibson, Newcastle University
Ryan Gilmour, WWU Münster
Hubert Girault, EPFL
Frank Glorius, WWU Münster
Leticia González, University of Vienna
Duncan Graham, University of Strathclyde

Vicki Grassian, University of California, San Diego
Alexis Grimaud, Boston College
Christian Hackenberger, FMP Berlin
Xinghan Han, Chinese Academy of Sciences
Christy Haynes, University of Minnesota
Patrick Holland, Yale University
Kim Jelfs, Imperial College London
Yousung Jung, KAIST
Stephanie Kath-Schorr, University of Cologne
Takashi Kato, University of Tokyo
Christopher Kelly, Janssen Research & Development
Jérôme Lacour, University of Geneva
Ai-Lan Lee, Heriot-Watt University
Daniele Leonori, RWTH Aachen University
Chao-Jun Li, McGill University
Yi Li, Jilin University
Mi Hee Lim, KAIST
Wenbin Lin, University of Chicago
Kopin Liu, Academia Sinica
Watson Loh, UNICAMP
Bettina Lotsch, Max Planck Institute
Xiong Wen (David) Lou, Nanyang Technological University
Kazuhiko Maeda, Tokyo Institute of Technology
Satoshi Maeda, Hokkaido University
Swadhin Mandal, IISER Kolkata
Ellen Matson, University of Rochester
Scott Miller, Yale University
Daniel Mndiola, University of Pennsylvania
Wonwoo Nam, Ewha Womans University
Jonathan Nitschke, University of Cambridge
Allie Obermeyer, Columbia University
Martin Oestreich, Technical University of Berlin
Takashi Ooi, Nagoya University
Rachel O'Reilly, University of Birmingham
Oleg Ozerov, Texas A&M University
Xiulian Pan, Dalian Institute of Chemical Physics
Nicolas Plummer, Technical University of

Munich
Rasmita Raval, University of Liverpool
Erwin Reisner, University of Cambridge
Andrea Rentmeister, WWU Münster
Jeffrey Rinehart, University of California, San Diego
Stuart Rowan, University of Chicago
Richmond Sarpong, University of California, Berkeley
Danielle Schultz, Merck
Dwight Seferos, University of Toronto
Oliver Seitz, Humboldt University of Berlin
Roberta Sessoli, University of Florence
Kay Severin, Federal Polytechnic School of Lausanne
Mikiko Sodeoka, RIKEN
Galo Soler-Illia, Universidad Nacional de San Martin
David Spring, University of Cambridge
Brian Stoltz, California Institute of Technology
Brent Sumriner, University of Florida
Raghavan B. Sunoj, IIT Bombay
Yogesh Surendranath, MIT
Mizuki Tada, Nagoya University
Ben Zhong Tang, The Hong Kong University of Science and Technology
Zhiyong Tang, National Center for Nanoscience and Nanotechnology
Christine Thomas, Ohio State University
He Tian, East China University of Science & Technology
Zhong-Qun Tian, Xiamen University
F. Dean Toste, University of California, Berkeley
Takashi Uemura, University of Tokyo
Jan van Hest, Radboud University
Latha Venkataraman, Columbia University
Chu Wang, Peking University
Julia Weinstein, University of Sheffield
Tom Welton, Imperial College London
Charlotte Williams, University of Oxford
Vivian Yam, University of Hong Kong
Qi-Lin Zhou, Nankai University
Jenny Zhang, University of Cambridge

Information for Authors

Full details on how to submit material for publication in Chemical Science 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/chemical-science

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

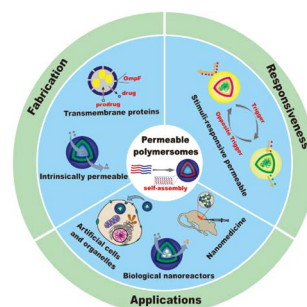


REVIEW

7411

Recent advances in permeable polymersomes: fabrication, responsiveness, and applications

Yanyan Zhu, Shoupeng Cao, Meng Huo,* Jan C. M. van Hest* and Hailong Che*

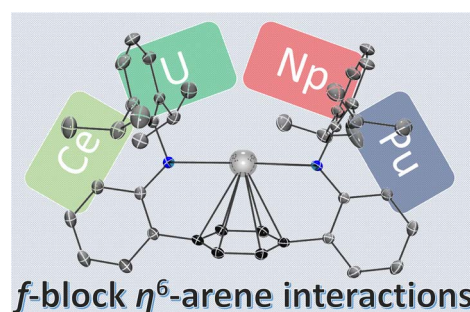


EDGE ARTICLES

7438

Synthesis and comparison of iso-structural f-block metal complexes (Ce, U, Np, Pu) featuring η^6 -arene interactions

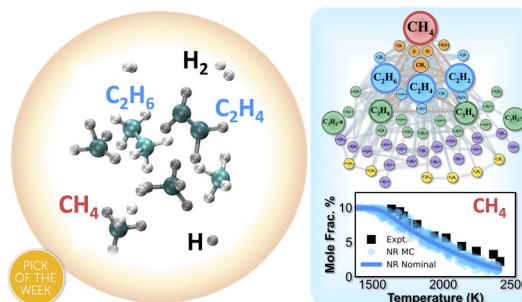
Jesse Murillo, Conrad A. P. Goodwin, Lauren Stevens, Skye Fortier,* Andrew J. Gaunt* and Brian L. Scott



7447

First principles reaction discovery: from the Schrodinger equation to experimental prediction for methane pyrolysis

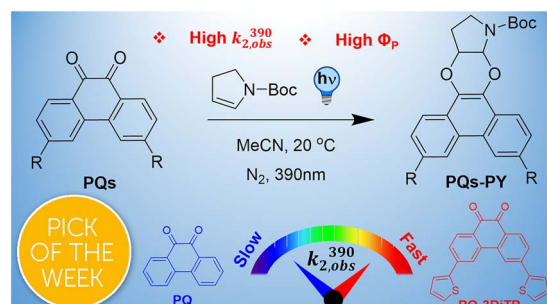
Rui Xu, Jan Meisner, Alexander M. Chang, Keiran C. Thompson and Todd J. Martínez*



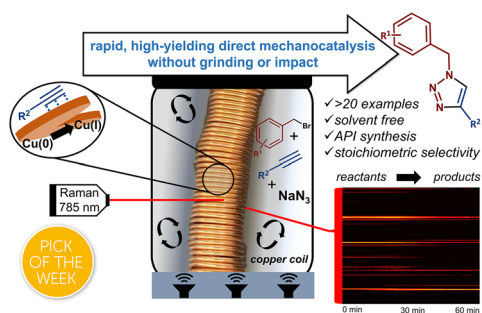
7465

Establishing PQ-ERA photoclick reactions with unprecedented efficiency by engineering of the nature of the phenanthraquinone triplet state

Youxin Fu, Georgios Alachouzos, Nadja A. Simeth, Mariangela Di Donato, Michiel F. Hilbers, Wybren Jan Buma,* Wiktor Szymanski* and Ben L. Feringa*



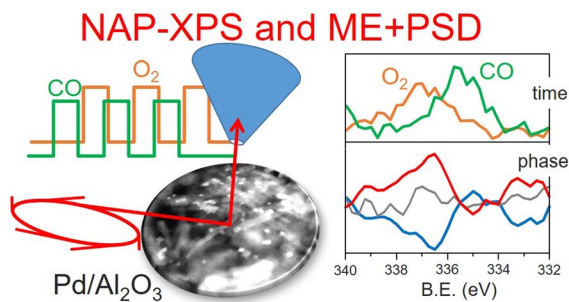
7475



Direct mechanocatalysis by resonant acoustic mixing (RAM)

Cameron B. Lennox, Tristan H. Borchers, Lori Gonnet, Christopher J. Barrett, Stefan G. Koenig,* Karthik Nagapudi* and Tomislav Friščić*

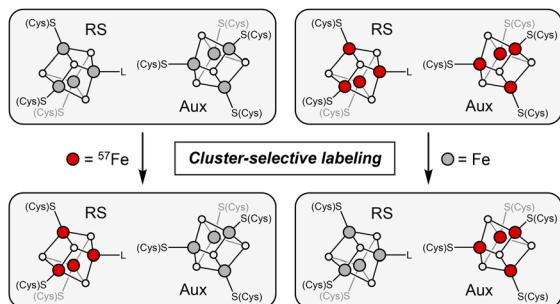
7482



Improving time-resolution and sensitivity of *in situ* X-ray photoelectron spectroscopy of a powder catalyst by modulated excitation

M. Roger, L. Artiglia,* A. Boucly, F. Buttignol, M. Agote-Arán, J. A. van Bokhoven, O. Kröcher and D. Ferri*

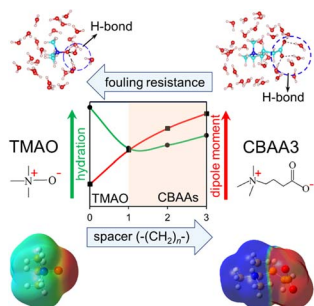
7492



Cluster-selective ⁵⁷Fe labeling of a Twitch-domain-containing radical SAM enzyme

Gil Namkoong and Daniel L. M. Suesse*

7500



Hydration behaviors of nonfouling zwitterionic materials

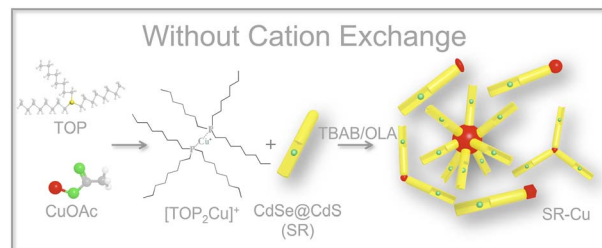
Pranab Sarker, Tieyi Lu, Di Liu, Guangyao Wu, Hanning Chen, Md Symon Jahan Sajib, Shaoyi Jiang,* Zhan Chen* and Tao Wei*



7512

Shape tunability of copper nanocrystals deposited on nanorods

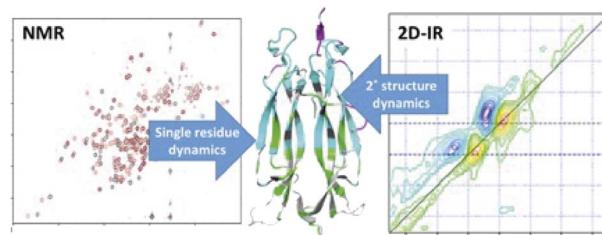
Yuexing Chen and Lilac Amirav*



7524

Modulation of IL-17 backbone dynamics reduces receptor affinity and reveals a new inhibitory mechanism

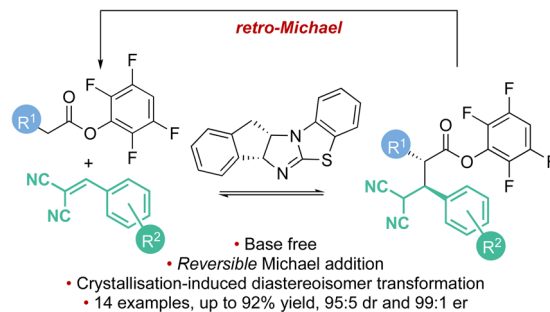
Daniel J. Shaw, Lorna C. Waters, Sarah L. Strong, Monika-Sarah E. D. Schulze, Gregory M. Greetham, Mike Towrie, Anthony W. Parker, Christine E. Prosser, Alistair J. Henry, Alastair D. G. Lawson, Mark. D. Carr, Richard J. Taylor, Neil T. Hunt* and Frederick W. Musket*



7537

Enantioselective isothiurea-catalysed reversible Michael addition of aryl esters to 2-benzylidene malonitriles

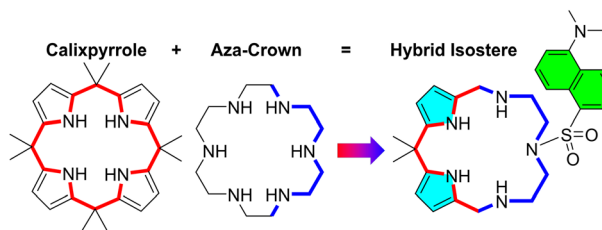
Alastair J. Nimmo, Jacqueline Bitai, Claire M. Young, Calum McLaughlin, Alexandra M. Z. Slawin, David B. Cordes and Andrew D. Smith*



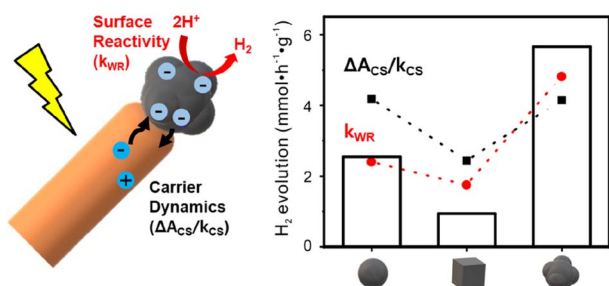
7545

Azacrown-calixpyrrole isosteres: receptors and sensors for anions

Austin R. Sartori, Aco Radujević, Sandra M. George and Pavel Anzenbacher, Jr*



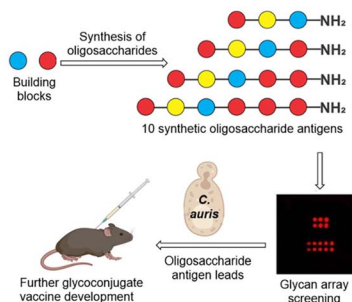
7553



Pt cocatalyst morphology on semiconductor nanorod photocatalysts enhances charge trapping and water reduction

Bumjin Park, Won-Woo Park, Ji Yong Choi, Woong Choi, Young Mo Sung, Soohwan Sul,* Oh-Hoon Kwon* and Hyunjoon Song*

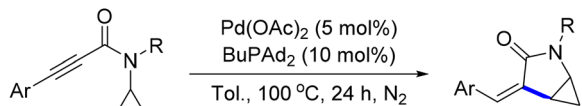
7559



Synthesis of oligosaccharides to identify an immunologically active epitope against *Candida auris* infection

Rajat Kumar Singh, Emelie E. Reuber, Mariolina Bruno, Mihai G. Netea and Peter H. Seeberger*

7564

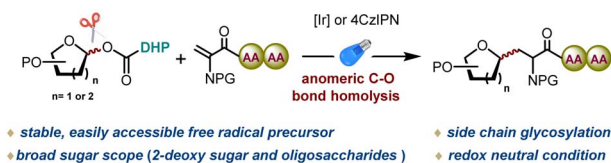


Palladium-catalyzed intramolecular asymmetric hydrocyclopropanylation of alkynes: synthesis of cyclopropane-fused γ -lactams

Han-Ze Lin, Zhuang Qi, Qi-Min Wu, Yong-Yu Jiang and Jin-Bao Peng*

- ♥ mild conditions
 - ♦ cyclopropane-fused γ -lactams
 - ♣ 100% atom economy
 - ♠ sp^3 C-H bond activation
- 21 examples
up to 96% yield
up to 91% ee

7569



Stereoselective alkyl C-glycosylation of glycosyl esters via anomeric C–O bond homolysis: efficient access to C-glycosyl amino acids and C-glycosyl peptides

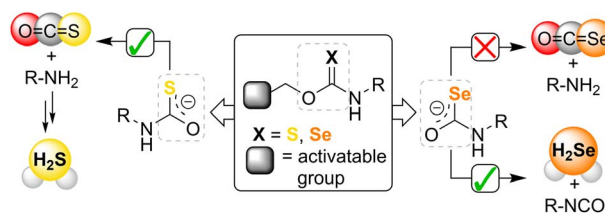
Anrong Chen, Shiyin Zhao, Yang Han, Zhenghong Zhou, Bo Yang, Lan-Gui Xie,* Maciej A. Walczak* and Feng Zhu*



7581

Direct hydrogen selenide (H_2Se) release from activatable selenocarbamates

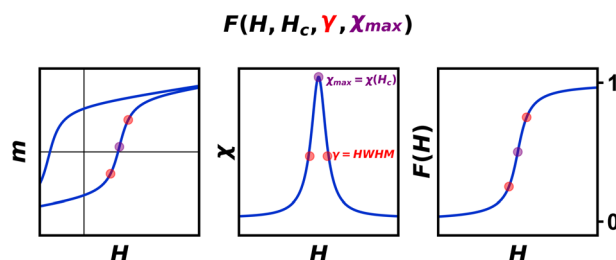
Turner D. Newton, Keyan Li, Jyoti Sharma, Pier Alexandre Champagne* and Michael D. Pluth*



7589

Quantifying superparamagnetic signatures in nanoparticle magnetite: a generalized approach for physically meaningful statistics and synthesis diagnostics

Kyle M. Kirkpatrick, Benjamin H. Zhou, Philip C. Bunting and Jeffrey D. Rinehart*



7595

Correction: Abiotic microcompartments form when neighbouring droplets fuse: an electrochemiluminescence investigation

Silvia Voci, Thomas B. Clarke and Jeffrey E. Dick*

