

NANOTECHNOLOGY REVIEWS

EDITOR-IN-CHIEF

Challa Kumar, Harvard University, USA

EDITORS

Michael R. Hamblin, Harvard Medical School, USA

Alberto Bianco, CNRS, France

Rongchao Jin, Carnegie Mellon University, USA

J. Michael Koehler, Technical University Ilmenau, Germany

Mantu K. Hudait, Virginia Tech, USA

Ning Dai, Chinese Academy of Sciences, China

Abigail Lytton-Jean, Massachusetts Institute of Technology, USA

Jianping Xie, National University of Singapore, Singapore

Lynn A. Bryan, Purdue University, USA

Rose Thiessen, Knobbe Martens Olson & Bear LLP, USA

Christoph Alexiou, University Hospital Erlangen, Germany

Jae-Seung Lee, Korea University, Korea

Marie-Hélène Delville, University of Bordeaux I, France

Ning Yan, National University of Singapore, Singapore

DE GRUYTER

ABSTRACTED/INDEXED IN Celdes; Chemical Abstracts Service (CAS)-SciFinder; CNKI Scholar (China National Knowledge Infrastructure); CNPIEC; EBSCO-TOC Premier; EBSCO Discovery Service; Elsevier-SCOPUS; Google Scholar; Inspec; J-Gate; JournalTOCs; Naviga (Softweco); Paperbase; Pirabase; Polymer Library; Primo Central (ExLibris); ProQuest (relevant databases); ReadCube; SCImago (SJR); Summon (Serials Solutions/ProQuest); TDOne (TDNet); TEMA Technik und Management; Thomson Reuters-Current Contents/Physical, Chemical and Earth Sciences; Thomson Reuters-Journal Citation Reports/Science Edition; Thomson Reuters-Science Citation Index Expanded; Ulrich's Periodicals Directory/ulrichsweb; WorldCat (OCLC)

The publisher, together with the authors and editors, has taken great pains to ensure that all information presented in this work (programs, applications, amounts, dosages, etc.) reflects the standard of knowledge at the time of publication. Despite careful manuscript preparation and proof correction, errors can nevertheless occur. Authors, editors and publisher disclaim all responsibility for any errors or omissions or liability for the results obtained from use of the information, or parts thereof, contained in this work.

The citation of registered names, trade names, trademarks, etc. in this work does not imply, even in the absence of a specific statement, that such names are exempt from laws and regulations protecting trademarks etc. and therefore free for general use.

ISSN 2191-9089 · e-ISSN 2191- 9097

All information regarding notes for contributors, subscriptions, Open access, back volumes and orders is available online at www.degruyter.com/ntrev.

RESPONSIBLE EDITOR Prof. Challa Kumar, IMASC/Rowland Institute for Science, Harvard University, 100 Edwin H. Land Blvd., Cambridge, MA 02142, USA

Tel: +1-617-497 4747, Fax: +1-617-497 4627

Email: ntrev.eic@degruyter.com

JOURNAL MANAGER Dr. Gunda Stöber, De Gruyter, Genthiner Str. 13, 10785 Berlin, Germany.

Tel.: +49 (0)30 26005-279, Fax: +49 (0)30 26005-298

Email: ntrev.editorial@degruyter.com

RESPONSIBLE FOR ADVERTISEMENTS Heiko Schulze, De Gruyter, Genthiner Straße 13, 10785 Berlin, Germany. Tel.: +49 (0)30 260 05-358, Fax: +49 (0)30 260 05-264, E-mail: anzeigen@degruyter.com

© 2015 Walter de Gruyter GmbH, Berlin/Boston

TYPESETTING Compuscript Ltd., Shannon, Ireland

PRINTING Franz X. Stückle Druck und Verlag e.K., Ettenheim

Printed in Germany

COVER ILLUSTRATION Nerve cells and neuronal network; ©NiroDesign/iStock/thinkstock



Contents

Special issue: Interfaces in hybrid materials and nanocomposites for nanoscience and nanotechnology

Issue editor: Marie-Hélène Delville

Editorial

Marie-Hélène Delville

The interface at the nanoscale level: implications from synthesis to applications — 485

Reviews

Oana Pascu, Samuel Marre and Cyril Aymonier

Creation of interfaces in composite/hybrid nanostructured materials using supercritical fluids — 487

Mohamed Gouné, Philippe Maugis and Frédéric Danoix

Nucleation and growth of carbo-nitride nanoparticles in α -Fe-based alloys and associated interfacial process — 517

Yanan Yue, Jingchao Zhang, Xiaoduan Tang, Shen Xu and Xinwei Wang

Thermal transport across atomic-layer material interfaces — 533

Pierre Rabu, Emilie Delahaye and Guillaume Rogez

Hybrid interfaces in layered hydroxides: magnetic and multifunctional superstructures by design — 557

Aurelie Walter, Antonio Garofalo, Audrey Parat, Herve Martinez, Delphine Felder-Flesch and Sylvie Begin-Colin
Functionalization strategies and dendronization of iron oxide nanoparticles — 581

Athanasia Kostopoulou and Alexandros Lappas

Colloidal magnetic nanocrystal clusters: variable length-scale interaction mechanisms, synergetic functionalities and technological advantages — 595