

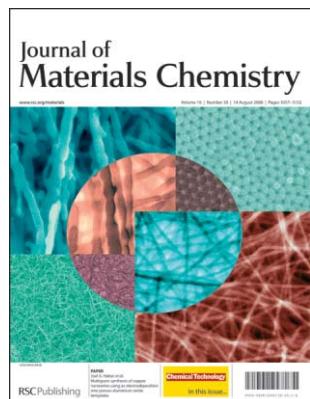
Journal of Materials Chemistry

www.rsc.org/materials

RSC Publishing is a not-for-profit publisher and a division of the Royal Society of Chemistry. Any surplus made is used to support charitable activities aimed at advancing the chemical sciences. Full details are available from www.rsc.org

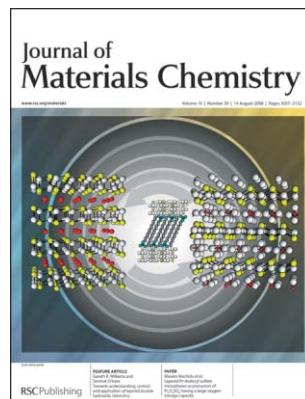
IN THIS ISSUE

ISSN 0959-9428 CODEN JMACEP 16(30) 3057–3152 (2006)



Cover

See Genaro A. Gelves *et al.*, pp. 3075–3083.
Copper nanowires grown in porous aluminium oxide templates and liberated using acid or base possess different diameters and surface roughness.
Image reproduced by permission of Joel A. Haber from *J. Mater. Chem.*, 2006, **16**, 3075.



Inside cover

See M. Machida *et al.*, pp. 3084–3090.
A large-capacity oxygen storage material, $\text{Pr}_2\text{O}_2\text{SO}_4$, was synthesized from Pr-based surfactant mesophases templated by dodecyl sulfate. Image reproduced by permission of Masato Machida from *J. Mater. Chem.*, 2006, **16**, 3084.

CHEMICAL TECHNOLOGY

T29

Chemical Technology highlights the latest applications and technological aspects of research across the chemical sciences.

Chemical Technology

August 2006/Volume 3/Issue 8

www.rsc.org/chemicaltechnology

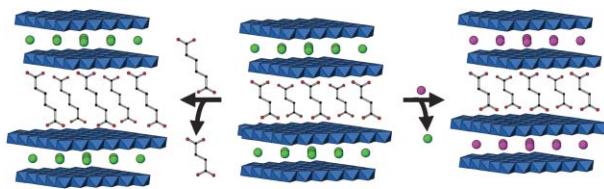
FEATURE ARTICLE

3065

Towards understanding, control and application of layered double hydroxide chemistry

Gareth R. Williams and Dermot O'Hare*

Some of the most exciting recent developments in LDH chemistry are discussed, with an emphasis on how we can control their chemistry and how *in situ* techniques can provide enhanced understanding of the nanoscopic processes involved in intercalation reactions.



EDITORIAL STAFF

Editor

Carol Stanier

Deputy editor

Sophia Anderton

Commissioning editor

Katie Gibb

Assistant editors

Rebecca Gillan, Neil Withers

Publishing assistant

Daisy Barton

Team leader, serials production

Michelle Canning

Technical editorsSusan Askey, Vicki Chapman, Jane Crawshaw,
Danièle Gibney, Carole Nerney, Michael Spencelayh**Administration coordinator**

Sonya Spring

Editorial secretaries

Lynne Braybrook, Jill Segev, Julie Thompson

Publisher

Janet Dean

Journal of Materials Chemistry (print: ISSN 0959-9428; electronic: ISSN 1364-5501) is published 48 times a year by The Royal Society of Chemistry, Thomas Graham House, Science Park, Milton Road, Cambridge, UK CB4 0WF. Tel +44 (0) 1223 420066; Fax +44 (0) 1223 420247; E-mail materials@rsc.org

All orders, with cheques made payable to the Royal Society of Chemistry, should be sent to RSC Distribution Services, c/o Portland Customer Services, Commerce Way, Colchester, Essex, UK CO2 8HP. Tel +44 (0) 1206 226050; Email sales@rscdistribution.org

2006 Annual (print+electronic) subscription price: £1991; US \$3644. 2006 Annual (electronic) subscription price: £1792; US\$3279. Customers in Canada will be subject to a surcharge to cover GST. Customers in the EU subscribing to the electronic version only will be charged VAT.

If you take an institutional subscription to any RSC journal you are entitled to free, site-wide web access to that journal. You can arrange access via Internet Protocol (IP) address at www.rsc.org/ip. Customers should make payments by cheque in sterling payable on a UK clearing bank or in US dollars payable on a US clearing bank. Periodicals postage paid at Rahway, NJ, USA, and at additional mailing offices. Airfreight and mailing in the USA by Mercury Airfreight International Ltd, 365 Blair Road, Avenel, NJ 07001, USA.

US Postmaster: Send address changes to: Journal of Materials Chemistry, c/o Mercury Airfreight International Ltd., 365 Blair Road, Avenel, NJ 07001. All dispatches outside the UK by Consolidated Airfreight.

PRINTED IN THE UK.

Advertisement sales: Tel +44 (0) 1223 432246;
Fax +44 (0) 1223 426017; E-mail advertising@rsc.org

Journal of Materials Chemistry

www.rsc.org/materials

Journal of Materials Chemistry is a weekly, international journal that publishes high impact work covering all aspects of the chemistry of novel materials in all forms, particularly materials associated with new technologies. Coverage of the field is broad and includes the design and synthesis of materials, their characterization, processing, modelling, properties and applications.

EDITORIAL BOARD

Chair

Maurizio Prato, Trieste

**Associate editor
for China**

Daoben Zhu, Beijing

**Associate editor for
North America**

Fred Wudl, Los Angeles

Cameron Alexander, Nottingham

Eugenio Coronado, Valencia

**Associate editor
for Japan**

Takuzo Aida, Tokyo

John Irvine, St Andrews

Vincent Rotello, Massachusetts

Clément Sanchez, Paris

Carsten Tschierske, Halle

INTERNATIONAL ADVISORY EDITORIAL BOARD

T. P. Davis, Sydney, Australia

K. Müllen, Mainz, Germany

W. J. Feast, Durham, UK

D. G. Nicholson, Trondheim,

H. Fjellvåg, Oslo, Norway

Norway

J. W. Goodby, York, UK

G. A. Ozin, Toronto, Canada

M. Grätzel, Lausanne, Switzerland

I. Parkin, London, UK

C. Greaves, Birmingham, UK

C. N. R. Rao, Bangalore, India

D. M. Guldi, Erlangen, Germany

S.-W. Rhee, Pohang, Korea

A. B. Holmes, Melbourne, Australia

T. Rojo, Bilbao, Spain

R. Kanno, Tokyo, Japan

N. S. Sariçiftçi, Linz, Austria

H. Kobayashi, Okazaki, Japan

A. Simon, Stuttgart, Germany

J. Livage, Paris, France

T. M. Swager, Cambridge, USA

N. Martín, Madrid, Spain

J.-M. Tarascon, Amiens, France

E. W. Meijer, Eindhoven, Netherlands

J. O. Thomas, Uppsala, Sweden

L. M. Liz Marzán, Vigo, Spain

J. Veciana, Barcelona, Spain

C. Mirkin, Northwestern, USA

INFORMATION FOR AUTHORS

Full details on how to submit material for publication in Journal of Materials Chemistry are given in the Instructions for Authors (available from <http://www.rsc.org/authors>). Submissions should be sent via ReSourCe: <http://www.rsc.org/resource>

Submissions: The journal welcomes submissions of manuscripts for publication as Full Papers, Communications, Feature Articles, Highlights and Applications. Full Papers and Communications should describe original work of high quality and impact which must highlight the novel properties or applications (or potential properties/applications) of the materials studied.

Colour figures are reproduced free of charge where the use of colour is scientifically necessary. Authors who wish to publish other figures in colour will be asked to contribute towards the costs of colour reproduction. Additional details are available from the Editorial Office or <http://www.rsc.org/is/authors>

Cover artwork: Authors may submit suggestions for cover artwork for consideration along with their manuscripts.

Authors may reproduce/republish portions of their published contribution without seeking permission

from the RSC, provided that any such republication is accompanied by an acknowledgement in the form: (Original Citation)–Reproduced by permission of The Royal Society of Chemistry.

© The Royal Society of Chemistry 2006. 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.

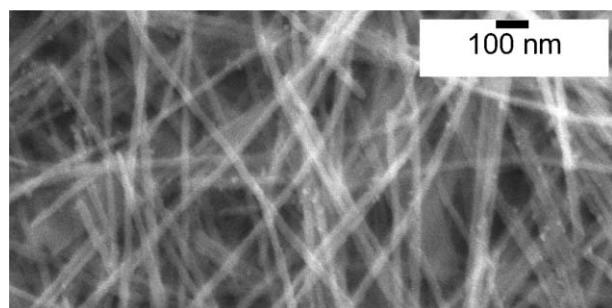
The Royal Society of Chemistry takes reasonable care in the preparation of this publication but does not accept liability for the consequences of any errors or omissions.

⊗ The paper used in this publication meets the requirements of ANSI/NISO Z39.48–1992 (Permanence of Paper).

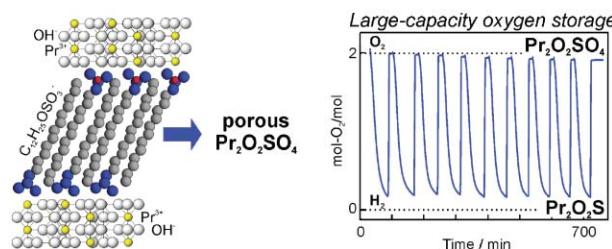
Royal Society of Chemistry: Registered Charity No. 207890.

PAPERS

3075

Multigram synthesis of copper nanowires using ac electrodepositio into porous aluminium oxide templatesGenaro A. Gelves, Zakari T. M. Murakami,
Matthew J. Krantz and Joel A. Haber*High aspect ratio copper nanowires (25 nm in diameter and average length of *ca.* 2 μm) have been synthesized in gram quantities by template-directed synthesis using porous aluminium oxide.

3084

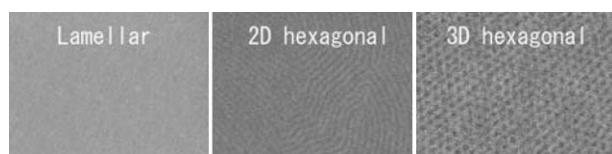
Layered Pr-dodecyl sulfate mesophases as precursors of $\text{Pr}_2\text{O}_2\text{SO}_4$ having a large oxygen-storage capacityMasato Machida,* Kiyotaka Kawamura,
Tomoatsu Kawano, Donjie Zhang and Keita IkeueSurfactant-assisted synthesis of the oxysulfate $\text{Pr}_2\text{O}_2\text{SO}_4$ with a large oxygen-storage capacity was studied with the aim of increasing the rate of redox cycles at lower temperatures.

3091

Q **Structural study of highly ordered mesoporous silica thin films and replicated Pt nanowires by high-resolution scanning electron microscopy (HRSEM)**

Chia-Wen Wu,* Yusuke Yamauchi, Tetsu Ohsuna and Kazuyuki Kuroda*

The mesostructures of mesoporous silica thin films and replicated Pt nanowires have been characterized by scanning electron microscopy. Mesostructural changes of thin films induced by calcination and methods for film formation are directly observed.

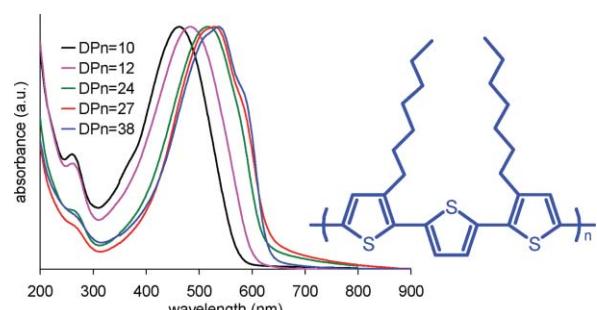


3099

Q **Effect of molecular weight on electronic, electrochemical and spectroelectrochemical properties of poly(3,3'-dioctyl-2,2':5',2"-terthiophene)**

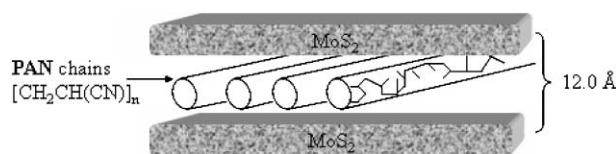
Rafal Pokrop, Jean-Marie Verilhac, Anna Gasior, Ireneusz Wielgus, Małgorzata Zagorska,* Jean-Pierre Travers and Adam Pron

Poly(3,3'-dioctyl-2,2':5',2"-terthiophene) has been fractionated to study the effect of the chain length on the polymer redox, spectroscopic and electronic transport properties.



PAPERS

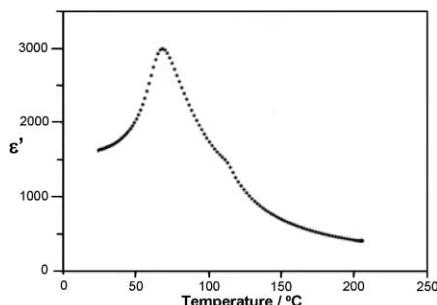
3107

**Poly(acrylonitrile)-molybdenum disulfide polymer electrolyte nanocomposite**

María Angélica Santa Ana, Eglantina Benavente, Pedro Gómez-Romero and Guillermo González*

This new polyacrylonitrile–MoS₂ nanocomposite improves the electrochemical properties of the components, thus becoming potentially useful as an electrode in rechargeable lithium batteries.

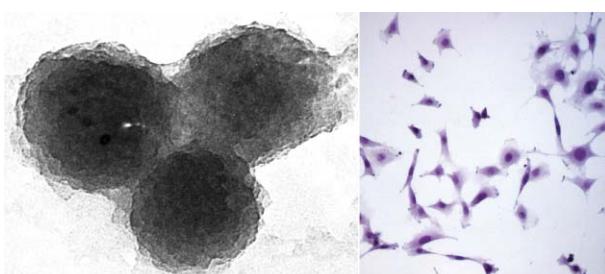
3114

**Synthesis and electrical properties of Nb-doped BaTiO₃**

N. Masó, H. Beltrán, E. Cordoncillo, A. Arenas Flores, P. Escribano, D. C. Sinclair and A. R. West

Permittivity of Nb-doped BaTiO₃ ceramics indicating compositional inhomogeneity that cannot be detected by powder X-ray diffraction.

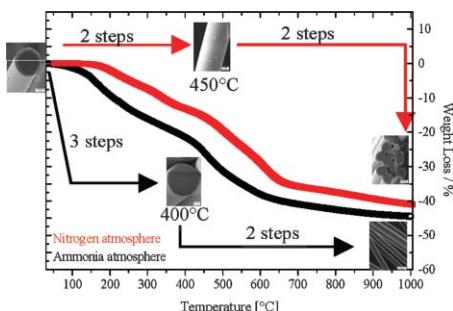
3120

**Biomimetic core–shell gelatine/silica nanoparticles: a new example of biopolymer-based nanocomposites**

Joachim Allouche, Michel Boissière, Christophe Hélary, Jacques Livage and Thibaud Coradin*

Gelatine/silica nanoparticles, obtained following a biomimetic approach, demonstrate the potential of hybrid materials for drug delivery applications.

3126

**Controlling the chemistry, morphology and structure of boron nitride-based ceramic fibers through a comprehensive mechanistic study of the reactivity of spinnable polymers with ammonia**

Sylvain Duperrier, Christel Gervais, Samuel Bernard,* David Cornu, Florence Babonneau and Philippe Miele

A comprehensive study on the reactivity of green fibers derived from borazine-based polymers in nitrogen and ammonia atmospheres has been undertaken during the preparation of boron nitride fibers.

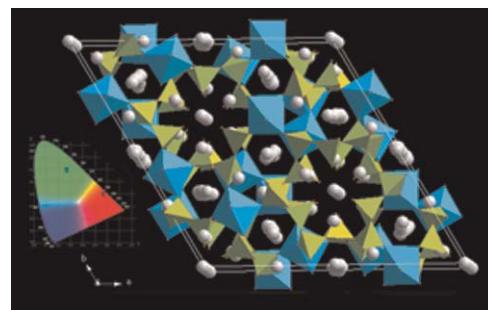
PAPERS

3139

**Photoluminescence of lanthanide NASICONs:
 $\text{Na}_5\text{LnSi}_4\text{O}_{12}$, Ln = Eu, Tb**

António Moreira dos Santos,* Fernando M. B. Marques, Luís D. Carlos and João Rocha

NASICON ionic conductors $\text{Na}_5\text{LnSi}_4\text{O}_{12}$, Ln = Eu^{3+} , Tb^{3+} , were synthesized with efficient red and green emission. Photoluminescence spectroscopy allowed the determination of the location of two lanthanide sites: in its standard crystallographic position and replacing sodium ions in the pores.

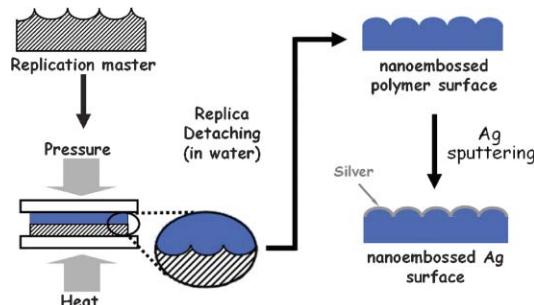


3145

Facile fabrication of large area nanostructures for efficient surface-enhanced Raman scattering

Daeseok Jung, Yoon Mi Lee, Yuwon Lee, Nam Hoon Kim, Kwan Kim* and Jin-Kyu Lee*

Many large area SERS-active films with closely packed nanoembossed Ag arrays could be reproducibly fabricated by the multiple replication method of polymer surfaces with nano-size grooved Al masters.



AUTHOR INDEX

Allouche, Joachim, 3120
Babonneau, Florence, 3126
Beltrán, H., 3114
Benavente, Eglantina, 3107
Bernard, Samuel, 3126
Boissière, Michel, 3120
Carlos, Luís D., 3139
Coradin, Thibaud, 3120
Cordoncillo, E., 3114
Cornu, David, 3126
dos Santos, António Moreira,
3139
Duperrier, Sylvain, 3126
Escribano, P., 3114

Flores, A. Arenas, 3114
Gasior, Anna, 3099
Gelves, Genaro A., 3075
Gervais, Christel, 3126
Gómez-Romero, Pedro, 3107
González, Guillermo, 3107
Haber, Joel A., 3075
Hélary, Christophe, 3120
Ikeue, Keita, 3084
Jung, Daeseok, 3145
Kawamura, Kiyotaka, 3084
Kawano, Tomoatsu, 3084
Kim, Kwan, 3145
Kim, Nam Hoon, 3145

Krantz, Matthew J., 3075
Kuroda, Kazuyuki, 3091
Lee, Jin-Kyu, 3145
Lee, Yoon Mi, 3145
Livage, Jacques, 3120
Machida, Masato, 3084
Marques, Fernando M. B., 3139
Masó, N., 3114
Miele, Philippe, 3126
Murakami, Zakari T. M., 3075
O'Hare, Dermot, 3065
Ohsuna, Tetsu, 3091
Pokrop, Rafal, 3099

Pron, Adam, 3099
Rocha, João, 3139
Santa Ana, Maria Angélica,
3107
Sinclair, D. C., 3114
Travers, Jean-Pierre, 3099
Verilhac, Jean-Marie, 3099
West, A. R., 3114
Wielgus, Ireneusz, 3099
Williams, Gareth R., 3065
Wu, Chia-Wen, 3091
Yamauchi, Yusuke, 3091
Zagorska, Małgorzata, 3099
Zhang, Donjie, 3084

FREE E-MAIL ALERTS AND RSS FEEDS

Contents lists in advance of publication are available on the web *via* www.rsc.org/materials – or take advantage of our free e-mail alerting service (www.rsc.org/ej_alert) to receive notification each time a new list becomes available.

RSS Try our RSS feeds for up-to-the-minute news of the latest research. By setting up RSS feeds, preferably using feed reader software, you can be alerted to the latest Advance Articles published on the RSC web site. Visit www.rsc.org/publishing/technology/rss.asp for details.

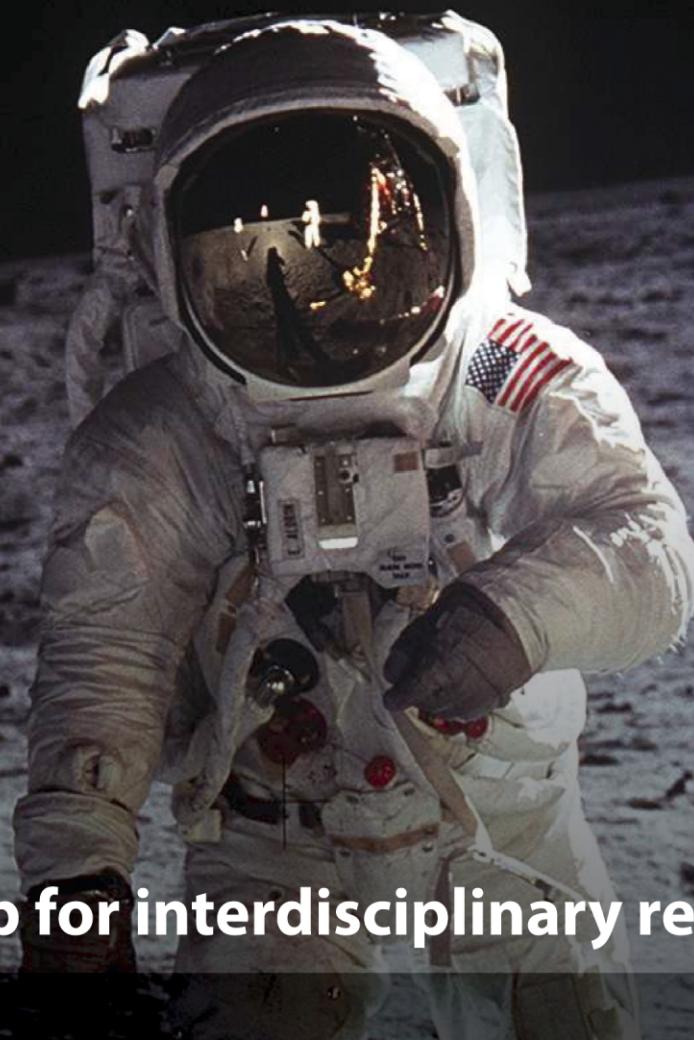
ADVANCE ARTICLES AND ELECTRONIC JOURNAL

Free site-wide access to Advance Articles and electronic form of this journal is provided with a full-rate institutional subscription. See www.rsc.org/ejs for more information.

* Indicates the author for correspondence: see article for details.

ESI Electronic supplementary information (ESI) is available *via* the online article (see <http://www.rsc.org/esi> for general information about ESI).

One small step for Soft Matter...



...one giant leap for interdisciplinary research

Launched: June 2005

Its mission: To provide an interdisciplinary platform for the exchange of ideas on soft matter

The crew: Piloted by Carol Stanier, Editor, and Ullrich Steiner, Chairman of the Editorial Board, bringing together leading international scientists

Flight schedule: Stage I – Launch; Stage II – Separation; Stage III – Exploring new territories

Soft Matter has enjoyed stellar success since launch. The next stage in its journey takes place in January 2007 when **Soft Matter** will separate from its host journal, *Journal of Materials Chemistry*, to take flight as a solo publication.

To ensure that you continue to read the very best in soft matter research recommend **Soft Matter** to your librarian today!