Applied Polymer

EDITOR-IN-CHIEF

Stefan Spiegel

DEPUTY EDITOR Hilary J. Crichton

ASSOCIATE EDITORS

Emily Hu Jenny Mahoney Mara Staffilani Xin Su ASSISTANT

MANAGING EDITORS Jenna Pope Jessica Bradley

PRODUCTION EDITOR

Melissa Ekis

FOUNDING EDITOR

Herman F. Mark

CONSULTING EDITOR

Eric Baer

EXECUTIVE EDITORS

Subramanian lyer

Eastman Chemical Company Advanced Polymer Engineer 100 Lincoln Street Kingsport, TN 37660, USA

Brian Knapp

PROMERUS LLC 9921 Brecksville Road Brecksville, OH 44141, USA Sergei Nazarenko

The University of Southern Mississippi, School of Polymers and High Performance Materials 118 College Drive MB #10076 Hattiesburg, MS 39406-0001, USA

Mark A. Schubert

Sherwin-Williams Company Breen Technology Center 601 Canal Road Cleveland, OH 44113 USA

EDITORIAL BOARD

Rigoberto Advincula

University of Houston Houston, TX, USA

Ann-Christine Albertsson

KTH Royal Institute of Technology Stockholm, Sweden

David Benko

The Goodyear Tire & Rubber Co. Akron, OH, USA

Anil Bhowmick

Indian Institute of Technology Kharagpur, India

Bryan Boudouris

Purdue University West Lafayette, IN, USA

Neal Chung

National University of Singapore Singapore

Robert E. Cohen

Massachusetts Institute of Technology Cambridge, MA, USA

Isabel C. Escobar

University of Toledo Toledo, OH, USA

Antonio Facchetti

Northwestern University Evanston, IL, USA

Lionel Flandin

Université de Savoie Le Bourget-du-lac, France

Andrzej Galeski

Polish Academy of Sciences Sienkiewicza, Poland

Julie M. Goddard

University of Massachusetts Amherst, MA, USA Sophie M. Guillaume

Université de Rennes Rennes, France

Atsushi Hotta

Keio University Yokohama, Japan

Yanbin Huang

Tsinghua University Beijing, China

Avraam I. Isayev

The University of Akron Akron, OH, USA

J. Karger-Kocsis

University of Technology and Economics Budapest, Hungary

Sangamesh Kumbar

University of Connecticut Health Center

Farmington, CT, USA

J. M. Lagaron

Novel Materials and Nanotechnology, IATA-CSIC

Valencia, Spain

Daeyeon Lee

University of Pennsylvania Philadelphia, PA, USA

Alan J. Lesser

University of Massachusetts Amherst, MA, USA

Yongfang Li

Chinese Academy of Sciences Beijing, China

Michael Malkoch

KTH Royal Institute of Technology Stockholm, Sweden

Jimmy W. Mays

University of Tennessee Knoxville, TN, USA

Michael A. R. Meier

Karlsruhe Institute of Technology Karlsruhe, Germany

Manjusri Misra

University of Guelph Guelph, Ontario, Canada

Koon-Gee Neoh

National University of Singapore Singapore

Roisin M. Owens

Ecole des Mines de St. Etienne Gardanne, France

Roberto Pantani

University of Salerno Salerno, Italy

Cheolmin Park

Yonsei University Seoul, South Korea

Ho Bum Park

Hanyang University Seoul, South Korea

Moon Jeong Park

POSTECH

Pohang, South Korea

Donald R. Paul

University of Texas Austin, TX, USA

Nicholas A. Peppas

University of Texas at Austin Austin, TX, USA

Luana Persano

National Research Council Italy

Robert K. Prud'homme

Princeton University Princeton, NJ, USA

David A. Putnam

Cornell University Ithaca, NY, USA Bluma G. Soares

Universidade Federal do Rio de Janeiro Rio de Janeiro, Brazil

S. C. Tjong

City University of Hong Kong Kowloon, Hong Kong

Jadranka Travas-Sejdic

University of Aukland Aukland, New Zealand

Christopher Tucker

The Dow Chemical Company Midland, MI, USA

Bart Van der Bruggen

KU Leuven Leuven, Belgium

Yu-Zhong Wang

Sichuan University Chengdu, China

Christoph Weder

University of Freiburg Freiburg, Germany

Robert A. Weiss

University of Connecticut Storrs, CT, USA

Andrew K. Whittaker

University of Queensland Brisbane, Australia

Paula Wood-Adams

Concordia University Montreal, QC, Canada

Kenneth J. Wynne

Virginia Commonwealth University Richmond, VA, USA

Lina Zhang

Wuhan University Wuhan, China

Ligun Zhang

Beijing University of Chemical Technology, Beijing, China

The JOURNAL OF APPLIED POLYMER SCIENCE (Print ISSN: 0021-8995; Online: 1097-4628) is published semi-monthly, by Wiley Subscription Services, Inc., a Wiley Company, 111 River St., Hoboken, NJ 07030-5774.

Periodical Postage Paid at Hoboken, NJ and additional offices.

Postmaster: Send all address changes to The JOURNAL OF APPLIED POLYMER SCIENCE, John Wiley & Sons Inc., C/O The Sheridan Press, PO Box 465, Hanover, PA 17331.

Copyright and Copying: Copyright @ 2016 Wiley Periodicals, Inc., a Wiley Company. All rights reserved. No part of this publication may be reproduced, stored or transmitted in any form or by any means without the prior permission in writing from the copyright holder. Authorization to copy items for internal and personal use is granted by the copyright holder for libraries and other users registered with their local Reproduction Rights Organisation (RRO), e.g. Copyright Clearance Center (CCC), 222 Rosewood Drive, Danvers, MA 01923, USA (www.copyright.com), provided the appropriate fee is paid directly to the RRO. This consent does not extend to other kinds of copying such as copying for general distribution, for advertising or promotional purposes, for creating new collective works or for resale. Special requests should be addressed to: permissions@wiley.com

Information for Subscribers: The Journal of Applied Polymer Science is published in 48 issues per year. Institutional subscription prices for 2016 are: Print & Online: ÚS\$38,297 (US), US\$38,938 (Rest of the World), €25,124 (Europe), £19,866 (UK). Prices are exclusive of tax. Asia-Pacific GST, Canadian GST/HST and European VAT will be applied at the appropriate rates. For more information on current tax rates, please go to www.wileyonlinelibrary.com/ tax-vat. The price includes online access to the current and all online back files to January 1st 2012, where available. For other pricing options, including access information and terms and conditions, please visit www.wileyonlinelibrary.com/access

For submission instructions, subscription and all other information visit: wileyonlinelibrary.com/journal/APP

Delivery Terms and Legal Title: Where the subscription price includes print issues and delivery is to the recipient's address, delivery terms are Delivered at Place (DAP); the recipient is responsible for paying any import duty or taxes. Title to all issues transfers FOB our shipping point, freight prepaid. We will endeavour to fulfil claims for missing or damaged copies within six months of publication, within our reasonable discretion and subject to availability.

Journal Customer Services: For ordering information, claims and any enquiry concerning your journal subscription please go to www.wileycustomerhelp.com/ask or contact your nearest office. **Americas**: Email: cs-journals@wiley.com; Tel: +1 781 388 8598 or +1 800 835 6770 (toll free in the USA & Canada).

Europe, Middle East and Africa: Email: cs-journals@wiley.com; Tel: +44 (0) 1865 778315

Asia Pacific: Email: cs-journals@wiley.com; Tel: +65 6511 8000. Japan: For Japanese speaking support, Email: cs-japan@wiley.com; Tel: +65 6511 8010 or Tel (toll-free): 005 316 50 480.

Visit our Online Customer Help available in 7 languages at www.wileycustomerhelp.com/ask

Production Editor: Melissa Ekis (email: APP@wiley.com) View this journal online at wileyonlinelibrary.com/journal/APP The JOURNAL OF APPLIED POLYMER SCIENCE accepts articles for Open Access publication. Please visit http://olabout.wiley.com/ WileyCDA/Section/id-406241.html for further information about OnlineOpen.

Back issues: Single issues from current and recent volumes are available at the current single issue price from cs-journals@wiley. com. Earlier issues may be obtained from Periodicals Service Company, 351 Fairview Avenue — Ste 300, Hudson, NY 12534, USA. Tel: +1 518 822-9300, Fax: +1 518 822-9305, E-mail: psc@periodicals.com

Advertising/Sales: Inquiries concerning advertising should be forwarded to the Advertising Sales Manager, c/o John Wiley & Sons, Inc., 111 River Street, Hoboken, NJ 07030; (201) 748-8832. Advertising Sales, European Contact: Jackie Sibley, c/o John Wiley & Sons, Ltd., The Atrium, Southern Gate, Chichester, West Sussex PO19 8SQ, England. Tel: 44 1243 770 351; Fax: 44 1243 770 432; e-mail: adsales@wiley.co.uk

Disclaimer: The Publisher and Editors cannot be held responsible for errors or any consequences arising from the use of information contained in this journal; the views and opinions expressed do not necessarily reflect those of the Publisher and Editors, neither does the publication of advertisements constitute any endorsement by the Publisher and Editors of the products advertised.

Other Correspondence: Address all other correspondence to: JOURNAL OF APPLIED POLYMER SCIENCE, Publisher, c/o John Wiley & Sons, Inc., 111 River Street, Hoboken, NJ 07030.

Wiley's Corporate Citizenship initiative seeks to address the environmental, social, economic, and ethical challenges faced in our business and which are important to our diverse stakeholder groups. Since launching the initiative, we have focused on sharing our content with those in need, enhancing community philanthropy, reducing our carbon impact, creating global guidelines and best practices for paper use, establishing a vendor code of ethics, and engaging our colleagues and other stakeholders in our efforts. Follow our progress at www.wiley.com/go/citizenship.

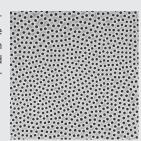
Abstracting and Indexing Services: The Journal is indexed by Chemical Abstracts, Chemical Titles, Chemistry Citation Index, Compendex, Current Contents/Engineering, Computing, and Technology, Current Contents/Physical, Chemical and Earth Sciences, INSPEC, ISI Alerting Services (includes Research Alert), Materials Science Citation Index, Polymer Blends, Alloys & Interpenetrating Polymer Networks Abstracts, Reaction Citation Index, Science Citation Index, SciSearch (also known as Science Citation Index-Expanded), Urethane Abstracts, World Surface Coatings Abstracts, and World Textiles.

Wiley's Corporate Citizenship initiative seeks to address the environmental, social, economic, and ethical challenges faced in our business and which are important to our diverse stakeholder groups. Since launching the initiative, we have focused on sharing our content with those in need, enhancing community philanthropy, reducing our carbon impact, creating global guidelines and best practices for paper use, establishing a vendor code of ethics, and engaging our colleagues and other stakeholders in our efforts. Follow our progress at www.wiley.com/go/citizenship

Printed in Singapore by Markono Print Media Pte Ltd.



The static breath figure method is an efficient process to prepare highly ordered polystyrene honeycomb-patterned surfaces. The order degree can be evaluated by Voronoi tessellation in order to obtain the conformational entropy of the arrays. The analysis of the surfaces indicates nonlinear relation between concentration and pore size in this system. In the studied systems, the analysis of hole size distribution and conformational entropy demonstrates the high order of the films obtained. This is a promising method for the fabrication of homogeneous and highly porous films from polystyrene. (DOI: 10.1002/app.44004)



Volume 133, Number 39 was mailed the week of July 25, 2016.

RESEARCH ARTICLES

43889 The flame retardancy and mechanical properties of jute/polypropylene composites enhanced by ammonium polyphosphate/polypropylene powder

Y. DOU, B. GUO, D. GUAN, L. SHI, W. YAO AND W. ZHANG

Published online 22 June 2016

43939 Synthesis of polyaminostyrene-based and polyallylamine-based sorbents for boron removal

D. V. NESTEROV, L. S. MOLOCHNIKOV, O. V. KORJAKOVA, M. I. KODESS, M. A. EZHIKOVA AND A. V. PESTOV

Published online 22 June 2016

43941 Poly(ethylene glycol) crosslinked sulfonated polysulfone composite membranes for forward osmosis

X. DING, Z. LIU, M. HUA, T. KANG, X. LI AND Y. ZHANG

Published online 28 June 2016

43943 Determination of trace macrolide antibiotics in milk with online solid-phase extraction with an ionic-liquid-based monolithic column

S. LIU, J. ZONG, Z. WEI, H. ZHANG, L. BAI, H. LIU AND H. YAN

Published online 21 June 2016

43946 Cellulose acetate ultrafiltration membranes reinforced by cellulose nanocrystals: Preparation and characterization

J. ZHOU, J. CHEN, M. HE AND J. YAO

Published online 17 June 2016

43950 An effective intumescent flame retardancy of LDPE induced by the combination of APP and CNCO-HA

C. FENG, M. LIANG, J. JIANG, Y. ZHANG, J. HUANG AND H. LIU

Published online 21 June 2016

43951 Mechanical properties, flame retardancy, and smoke suppression of lanthanum organic montmorillonite/poly(vinyl chloride) nanocomposites

Z. YIN, K. CHEN, H. WANG, H. WANG AND Z. WEI

Published online 21 June 2016

43968 Polymeric piezoelectric fiber with metal core produced by electrowetting-aided dry spinning method

W. LIU, R. CHEN, X. RUAN AND X. FU

Published online 20 June 2016

43970 Selection of thinner for epoxy-amine system used as binder for polymeric mortars

A. BOURGUIBA, W. DHAOUI AND E. GHORBEL

Published online 20 June 2016

43971 Slightly crosslinked polyurethane with Diels-Alder adducts from trimethylolpropane

P. DU, H. JIA, Q. CHEN, Z. ZHENG, X. WANG AND D. CHEN

Published online 26 June 2016

43972 Facile UV-curing technique to establish a 3D-grafted poly(ethylene glycol) layer on an epoxy resin base for underwater applications

Y. YANG, H. LUO, J. YANG, D. HUANG AND S. ZHOU

Published online 17 June 2016

43978 Basicity-based screening of aniline derivative for composite proton exchange membranes

V. K. SACHAN, A. M. RAJESH, N. PANDAY, R. K. NAGARALE AND P. K. BHATTACHARYA

Published online 17 June 2016

43987 Solvent-free synthesis of 6-deoxy-6-(ω-aminoalkyl)amino cellulose

T. HEINZE, A. PFEIFER, A. KOSCHELLA, J. SCHALLER AND F. MEISTER

Published online 21 June 2016

43988 Preparation and characterization of hydrophilic and antifouling poly(ether sulfone) ultrafiltration membranes modified with Zn-Al layered double hydroxides

Y. ZHAO, N. LI, F. YUAN, H. ZHANG AND S. XIA

Published online 21 June 2016

43989 Boron nitride based polyaniline nanocomposite: Preparation, property, and application

S. AHMAD, A. SULTAN, W. RAZA, M. MUNEER AND F. MOHAMMAD

Published online 21 June 2016

43990 Microwave-assisted polymerization: Inert addition and surface coating of superabsorbent polymer for improved physical properties

M. M. AZAD AND M. G. SANDROS

Published online 27 June 2016

43993 Electrochemical activity of sulfur networks synthesized through RAFT polymerization

C. ALMEIDA, H. COSTA, P. KADHIRVEL, A. M. QUEIROZ, R. C. S. DIAS AND M. R. P. F. N. COSTA

Published online 15 June 2016

43994 Morphological and mechanical behavior of chemically treated jute-PHBV bio-nanocomposites reinforced with silane grafted halloysite nanotubes

S. ZAINUDDIN, A. FAHIM, S. SHOIEB, F. SYED, M. V. HOSUR, D. LI, C. HICKS AND S. JEELANI

Published online 21 June 2016

43996 Styrene-hydroxyethyl acrylate copolymer based alkyd resins with a comb-type structural morphology obtained with a high solid content

M. C. MEJÍA AND E. A. MURILLO

Published online 22 June 2016

43997 Evaluation of viscosity and printing quality of chitosan-based flexographic inks: The effect of chitosan molecular weight

H. WANG, T. GUO AND H. LI

Published online 21 June 2016

43998 Solvents for thermoporosimetry analysis of natural rubber networks

M. WIRTZ, R. ROMMEL, J. L. VALENTÍN, S. WESTERMANN, F. SPORTELLI AND F. KAYSER

Published online 28 June 2016

4399 Composite blending of ionic liquid-poly(ether sulfone) polymeric membranes: Green materials with potential for carbon dioxide/methane separation

D. F. MOHSHIM, H. MUKHTAR AND Z. MAN *Published online 24 June 2016*

44000 The dominant factor for mechanical property of polyimide films containing heterocyclic moieties: In-plane orientation, crystallization, or hydrogen bonding

L. LUO, J. ZHANG, J. HUANG, Y. FENG, C. PENG, X. WANG AND X. LIU *Published online 21 June 2016*

44001 Semi-aromatic polyimide/Ag nanocomposite derived from vanillin

Z. MIRZAKHANIAN, K. FAGHIHI, H. A. GERAVI AND M. MAHDIEH

Published online 24 June 2016

44002 Magnetite/graphene/polyaniline composite for removal of aqueous hexavalent chromium

D. K. L. HARIJAN AND V. CHANDRA

Published online 24 June 2016

44003 Photo/pH dual-responsive biocompatible poly(methacrylic acid)-based particles for triggered drug delivery

L. YU, N. REN, K. YANG, M. ZHANG AND L. SU

Published online 24 June 2016

44004 Solvent and relative humidity effect on highly ordered polystyrene honeycomb patterns analyzed by Voronoi

L. RUIZ-RUBIO, I. AZPITARTE, N. GARCÍA-HUETE, J. M. LAZA, J. L. VILAS AND L. M. LEÓN Published online 24 June 2016

44006 Effects of supercritical carbon dioxide treatment on the morphology of poly(L-lactide)

C. TSUTSUMI, R. WATANABE, A. TOKUMARU, N. KUWAOKA, Y. NAKAYAMA AND T. SHIONO

Published online 24 June 2016