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, OC, 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



WILEY ONLINE LIBRARY

Access this journal and thousands of other essential resources.

Featuring a clean and easy-to-use interface, this online service delivers intuitive navigation, enhanced discoverability, expanded functionalities, and a range of personalization and alerting options.

Sign up for content alerts and RSS feeds, access full-text, learn more about the journal, find related content, export citations, and click through to references.



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.,

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: US\$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.wilevcustomerhelp.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 P019 8SQ, England. Tel: 44 1243 770 351; Fax: 44 1243 770 432: e-mail: adsales@wiley.co.uk

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.

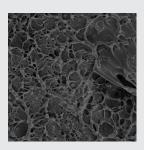
Abstracting and Indexing Services: The Journal is indexed by Chemical Abstracts, Chemical Titles, Chemistry Citation Index, Compendex, Current Contents/Engineering, Computing, and Technology, Current Contents/Physical, Chemical and Earth Sciences, INSPEC, ISI Alerting Services (includes Research Alert), 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



Because non-polar polymers such as polyethylene have numerous uses, manufacturing polyethylene nanocomposites with nanofillers has the potential to improve existing materials. Muhammad Z. lqbal, Ahmed A. Abdala and Matthew W. Liberatore propose a new method of altering the non-polar nature of polyethylene by blending with oxidized polyethylene. Blending polyethylene with oxidized polyethylene produces miscible blends with controlled processing and reduced viscosity. The cover picture is an SEM of blends of a formulation of 70% polyethylene and 30% oxidized polyethylene. The smooth surface of polyethylene changes into a fibrous, high modulus material, which is suitable for nanocomposites manufacturing. (DOI: 10.1002/app.43521)



Volume 133, Number 28 was mailed the week of April 25, 2016.

RESEARCH ARTICLES

43521 Synthesis and characterization of polyethylene/oxidized polyethylene miscible blends and role of OPE as a viscosity control

M. Z. IQBAL, A. A. ABDALA AND M. W. LIBERATORE

Published online 29 February 2016

43602 Preparation, optimization, and characterization of simvastatin nanoparticles by electrospraying: An artificial neural networks study

F. IMANPARAST, M. A. FARAMARZI, M. PAKNEJAD, F. KOBARFARD, A. AMANI AND M. DOOSTI

Published online 8 April 2016

43606 Transport properties of gases through integrally skinned asymmetric composite membranes prepared from date pit powder and polysulfone

J. K. ADEWOLE

Published online 8 April 2016

43648 Hydrolytic degradation of nanocomposites based on poly(L-lactic acid) and layered double hydroxides modified with a model drug

A. OYARZABAL, A. MUGICA, A. J. MÜLLER AND M. ZUBITUR

Published online 9 April 2016

43650 Synthesis of a hole-containing polypyrrole film modified by copper cementation

I. L. LEHR AND S. B. SAIDMAN

Published online 7 April 2016

43651 Toughening of syndiotactic polypropylene with chalk

L. PIETRZAK, P. SOWINSKI, J. BOJDA, E. PIORKOWSKA AND A. GALESKI

Published online 23 April 2016

43652 Carboxymethyl sago pulp/carboxymethyl sago starch hydrogel: Effect of polymer mixing ratio and study of controlled drug release

H. L. TAN, Y. Y. WONG, S. MUNIYANDY, K. HASHIM AND J. PUSHPAMALAR

Published online 5 April 2016

43654 Acrylic-based epoxy resin damping systems: Synthesis, characterization, and properties

Y. YANG, Y.-F. ZHAO, J.-Y. WANG, C. ZHAO, L. TONG, X.-Y. LIU AND M.-S. ZHAN

Published online 5 April 2016

43655 Elemental sulfur-based polymeric materials: Synthesis and characterization

M. K. SALMAN, B. KARABAY, L. C. KARABAY AND A. CIHANER

Published online 9 April 2016

43656 Enhanced adsorption and recovery of Pb(II) from aqueous solution by alkali-treated persimmon fallen leaves

R. FAN, Q. YI, Y. XIE, F. XIE, Q. ZHANG AND Z. LUO

Published online 9 April 2016

43657 Hemostatic activities of nano/microporous bilayer dressings in a femoral artery bleeding rat model

Z. KARAHALILOĞLU, M. DEMIRBILEK, İ ULUSOY, B. GÜMÜŞKAYA AND E. B. DENKBAŞ

Published online 14 April 2016

43658 Effects of TiO₂, ZnO, and Fe₃O₄ nanofillers on rheological behavior, microstructure, and reaction kinetics of rigid polyurethane foams

M. AKKOYUN AND E. SUVACI

Published online 7 April 2016

43660 Healing of polymeric artificial muscle reinforced ionomer composite by resistive heating

P. ZHANG, U. AYAUGBOKOR, S. IBEKWE, D. JERRO, S.-S. PANG, P. MENSAH AND G. LI

Published online 8 April 2016

43661 Flexible shielding layers for solar cells in space applications

 $\hbox{J. FEENSTRA, R. H. VAN LEEST, N. J. SMEENK, G. OOMEN, E. BONGERS, P. MULDER, E. VLIEG AND J. J. SCHERMER \\$

Published online 14 April 2016

43667 Poly(propylene carbonate) polyurethane self-polishing coating for marine antifouling application

Y. CHEN, Z. LIU, S. HAN, J. HAN AND D. JIANG

Published online 7 April 2016

43669 Biodegradable composites with improved barrier properties and transparency from the impregnation of PLA to bacterial cellulose membranes

L. URBINA, I. ALGAR, C. GARCÍA-ASTRAIN, N. GABILONDO, A. GONZÁLEZ, M. CORCUERA, A. ECEIZA AND A. RETEGI

Published online 9 April 2016

43670 Influence of support layer and PDMS coating conditions on composite membrane performance for ethanol/water separation by pervaporation

P. V. NAIK, R. BERNSTEIN AND IVO F. J VANKELECOM

Published online 14 April 2016

43672 The effects of residual polymerization solvent on the physical properties of poly(2-cyano-p-phenylene terephthalamide)

D. E. JUNG, D. J. KIM, Y. EOM, J. LEE AND B. C. KIM

Published online 8 April 2016

43673 Crystallization behavior and morphology of polylactic acid (PLA) with aromatic sulfonate derivative

V. NAGARAJAN, A. K. MOHANTY AND M. MISRA

Published online 14 April 2016

43674 Immobilization of bacteriocin nisin into a poly(vinyl alcohol) polymer matrix crosslinked with nontoxic dicarboxylic acid

M. HRABALIKOVA, P. HOLCAPKOVA, P. SULY AND V. SEDLARIK

Published online 9 April 2016

43677 Effect of molecular rigidity and hydrogen bond interaction on mechanical properties of polyimide fibers

Y. FENG, L. B. LUO, J. HUANG, K. LI, B. LI, H. WANG AND X. LIU

Published online 8 April 2016

43679 Inverted organic solar cells using nanocellulose as substrate

S. V. COSTA, P. PINGEL, S. JANIETZ AND A. F. NOGUEIRA

Published online 9 April 2016

43680 Structure, thermal stability, electrochemical behaviors, and mechanical properties of organosoluble polyimide with pyrimidine ring in the main chain

B. LI, Z. WU AND L. LIN

Published online 9 April 2016

43683 The influence of electron beam irradiation, plastic deformation, and re-irradiation on crystallinity degree, mechanical and sclerometric properties of GUR 1050 used for arthroplasty

A. BARYLSKI, J. MASZYBROCKA, M. KUPKA, K. ANIOŁEK AND Ł. MIESZCZAK

Published online 9 April 2016

43684 Relaxation behavior and activation energy of relaxation for polyimide and polyimide-graphene nanocomposite

W. F. MARASHDEH, J. LONGUN AND J. O. IROH

Published online 9 April 2016

43686 Ag-nanocomposite based on carboxymethylcellulose for humidity detection: Green synthesis and sensing performances

W. MARZOUK, N. SAKLY, S. ROUDESLI, H. B. OUADA AND H. MAJDOUB

Published online 9 April 2016