

e-POLYMERS

EDITORS-IN-CHIEF

Seema Agarwal, Bayreuth, Germany

Andreas Greiner, Bayreuth, Germany

EDITOR

Jian Ji, Hangzhou, China

FOUNDING EDITORS

Hartwig Hoecker

Stanislaw Penczek

EDITORIAL ADVISORY BOARD

Felix Schacher, Jena, Germany

Susanta Banerjee, Kharagpur, India

Prasad Shastri, Freiburg, Germany

Stephen Eichhorn, Exeter, UK

Zhu Meifang, Shanghai, China

Yasuhiko Iwasaki, Osaka, Japan

Piming Ma, Jiangsu, China

Stan Slomkowski, Lodz, Poland

Tamer Uyar, Ankara, Turkey

DE GRUYTER

ABSTRACTED/INDEXED IN Celdes, Chemical Abstracts Service (CAS), Chemical Abstracts Service (CAS) - SciFinder, CNPIEC, EBSCO Discovery Service, Electronic Journals Library, Elsevier - SCOPUS, J-Gate, Naviga (Softweco), Polymer Library, Primo Central (ExLibris), SCImago (SJR), Summon (Serials Solutions/ProQuest), TDOne (TDNet), TEMA Technik und Management, Thomson Reuters - Current Contents/Physical, Chemical and Earth Sciences, Thomson Reuters - Science Citation Index, 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 of 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 2197-4586 · e-ISSN 1618-7229

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

RESPONSIBLE EDITORS Prof. Dr. Seema Agarwal, Chair of Macromolecular Science II, University of Bayreuth, Building NW II, Universitätsstraße 30, 95440 Bayreuth, Tel.: +49-921-553397, Email agarwal@uni-bayreuth.de
Prof. Dr. Andreas Greiner, Chair of Macromolecular Science II, University of Bayreuth, Building NW II, Universitätsstraße 30, 95440 Bayreuth, Tel.: +49-921-553399, Email greiner@uni-bayreuth.de

JOURNAL MANAGER Dr. Karin E. Lason, De Gruyter, Genthiner Straße 13, 10785 Berlin, Germany, Tel.: +49 (0)30 260 05-276, Fax: +49 (0)30 260 05-184, Email: epolymers.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, Email: 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 Materials with a negative Poisson's ratio have been known since the early 1900s, although they did not capture researchers' attention until the late 1980s. Since 1991, these materials have been known as auxetic materials. Over the last three decades, it has been demonstrated that auxetic materials offer a huge potential for the fields of engineering, natural sciences, and biomedical engineering, and for many other industries, including the aerospace and defense industries. The development of auxetic polymers, which were first fabricated in the form of polyurethane foam approximately three decades ago are now used in the fabrication of woven, non-woven and nano to macro structures in all major classes of materials such as metals, ceramics, polymers and composites. Tailored with auxetic patterns, smart non-woven polymeric structures could be a good choice for the further development of auxetic medical devices such as implants, biodegradable stents, wound bandages, and scaffolds for tissue engineering. In addition, implementation of a multidisciplinary approach such as the combination of high-tech techniques and auxetic effect with other functions, such as shape memory effect and electromagnetic effect, to make multifunctional auxetic materials could enhance their potential for further applications in engineering industry and promote their candidature for biomedical fields.

For more information on this topic, please read the review "Three decades of auxetic polymers: a review" by Sukhwinder K. Bhullar on pages 205–215 of this issue.

Copyright holder of the image: Sukhwinder K. Bhullar, Department of Mechanical Engineering, Bursa Technical University, Bursa, Turkey and Department of Mechanical Engineering, University of Victoria, Victoria, BC, Canada, contact: sbhullar@uvic.ca



Contents

Editorial

Andreas Greiner and Seema Agarwal
Editorial July 2015 — 203

Review

Sukhwinder K. Bhullar
Three decades of auxetic polymers: a review — 205

Full length articles

Yinfeng Shi and Seema Agarwal
Thermally stable optically transparent copolymers of 2-methylene-1,3-dioxepane and *N*-phenyl maleimide with degradable ester linkages — 217

Tobias Rudolph, Sarah Crotty, Ulrich S. Schubert and Felix H. Schacher
Star-shaped poly(2-ethyl-2-oxazoline) featuring a porphyrin core: synthesis and metal complexation — 227

Parul Sharma, Garima Mathur, Navendu Goswami, Sanjeev K. Sharma, Sanjay R. Dhakate, Subhash Chand and Ashwani Mathur
Evaluating the potential of chitosan/poly(vinyl alcohol) membranes as alternative carrier material for proliferation of Vero cells — 237

Wei Wang, Liqin Cao, Jide Wang, Jie Zhao, Xiujuan Wu and Youwei Hao

Characterization and adsorptive properties of poly(1-vinylimidazole)/silica nanocomposites synthesized in supercritical carbon dioxide — 245

Atif Islam, Tariq Yasin, Aneela Sabir, Shahzad Maqsood Khan, Misbah Sultan, Muhammad Shafiq, Asad U. Khan and Tahir Jamil

High-temperature electrical properties of silane cross-linked chitosan/poly(vinyl alcohol) membrane: thermal, mechanical and surface characterization — 255

Kai Liang, Qingquan Liu and Meixuan Peng
Monodisperse cross-linked polystyrene nanospheres by emulsifier-free miniemulsion polymerization — 263

Jie Wu, Yanmei Zhou, Yang Meng, Jiaying Zhang, Qingbing Liu, Qimeng Cao and Yueqin Yu
Synthesis and properties of sodium alginate/poly(acrylic acid) double-network superabsorbent — 271

Communication

Farzad Lahooti-Fard, Mohammad Imani and Ali Akbar Yousefi
Solvent-dependent rheological behavior of concentrated solutions of a cationic acrylic terpolymer containing self-assembled chains — 279