VOLUME 73 NO. 3 YEAR 2022

JOURNAL OF COSMETIC SCIENCE The Official Journal of the Society of Cosmetic Chemists

Publishing technical papers on topics of interest to cosmetic scientists since 1947

PUBLISHED BY



SOCIETY OF COSMETIC CHEMISTS

Purchased for the exclusive use of nofirst nolast (unknown) From: SCC Media Library & Resource Center (library.scconline.org)

WWW.SCCONLINE.ORG/JOURNAL



ACCELERATING OUR SUSTAINABLE FUTURE

The 100% Bio-Based ECO Range is the widest range of 100% renewable surfactants on the market with over 50 different personal care ingredient codes. By using an alternative route to EO with bioethanol from biomass sources, it significantly increases the bio-based content of ethoxylated products and reduces reliance on fossil fuels.

This range of ingredients meets consumer demands for performance, while being 100% renewable and 100% bio-based. Moreover, the ingredients are manufactured with renewable energy and have a lower carbon footprint than petro-based options.

Join us on this sustainability journey Learn more about the 100% Bio-based ECO Range of surfactants.

Visit us at: www.crodapersonalcare.com

North America marketing-usa@croda.com Europe, Middle East & Africa pc-europe@croda.com

- 100% renewable
- 100% bio-based¹
- Vegan & Cruelty-Free Suitable²
- Low levels of 1,4-Dioxane
- Reduces reliance on fossil fuel feedstocks
- Manufactured with renewable energy
- Performance identical to petro-based options
- Lower carbon footprint than petrobased versions
- USDA Certified Biobased Product³
- RSPO Supply Chain Certified via Mass Balance⁴

(1) Calculated using USDA BioPreferred Method for determining bio-based content and validated, or being validated, by carbon 14 testing (ASTM D6886) (2) May be suitable for vegan and/or cruelty-free claims. If you are interested in making a vegan and/or cruelty-free claim, please request our Vegan Suitability statement and/or Animal Testing statement for specifics on this product and compare to the certification(s) you are seeking to meet (3) USDA BioPreferred[®] is a registered trademark of the U.S. Department of Agriculture (4) Products containing palm oil derivatives

Latin America marketinglatam@croda.com Asia Pacific pc-asia@croda.com



ECO Range

Purchased for the exclusive use of nofirst notast (unknown) From: SCC Media Library & Resource Center (library.scconline.org)



Journal of Cosmetic Science

The Official Journal of the Society of Cosmetic Chemists

SOCIETY OF COSMETIC CHEMISTS

Editor-in-Chief:	Trefor Evans, PhD, TRI-Princeton
Senior Associate Editor:	K.P. Ananthapadmanabhan, PhD , College of Pharmacy, University of Cincinnati
Associate Technical Editors:	: Jennifer Marsh, The Procter & Gamble Company
	Michael Davis, The Procter & Gamble Company
	Robert Lochhead, PhD, University of Southern Mississippi
	Roger McMullen, PhD, Ashland, LLC
	Gopinathan Menon, California Academy of Science
	Steve Madison, Quinnipiac University

President: Vice President: Vice President-Elect: Secretary: Treasurer: Chief Executive Officer: Michelle Hines, PhD, Mary Kay, Inc Mark Chandler, ACT Solutions Corporation Tony O'Lenick, Nascent Technologies Corporation Qihong Zhang, PhD, The Estee Lauder Companies Karen Chun, Symrise, Inc.

Erica L. O'Grady, CAE, Society of Cosmetic Chemists HQ



Subscription: JOURNAL OF COSMETIC SCIENCE, the Official Journal of the Society of Cosmetic Chemists is published six times per year with January/February, March/April, May/June, July/August, September/ October, November/December issues. Yearly subscription price is \$250.00 for 1-10 users, \$350 for 11-50 users, \$490 for 51-100 users and \$686 for 100+ users.

© Copyright 2022 by the Society of Cosmetic Chemists. Permission is granted to readers and nonprofit libraries acting for them for fair use of the material contained in this Journal. Permission is further granted to quote from this Journal in scientific works with the customary acknowledgment of the source. Consent from EACH OF THE ORIGINAL AUTHORS along with notification to the Society of Cosmetic Chemists is required to reprint a figure, table or other excerpt. The republication, systematic or multiple reproduction of any material in this Journal (including abstracts) is permitted under written license from the Society of Cosmetic Chemists. The Society of Cosmetic Chemists may also require that permission must be obtained from EACH OF THE AUTHORS. Address inquiries to the Editor.

JOURNAL OF COSMETIC SCIENCE, the Official Journal of the Society of Cosmetic Chemists is a registered trademark of the Society of Cosmetic Chemists.

POSTMASTER, MEMBERS AND SUBSCRIBERS. Send address changes to The Society of Cosmetic Chemists, 14 Wall Street, Suite 1620, New York. NY 10005. no responsibility for statements or opinions advanced by contributors to this Journal.

Missing numbers will not be supplied if claims are received more than 60 days after the date of the issue, or if loss was due to failure to give notice of change of address. The JCS cannot accept responsibility for foreign delivery when its records indicate shipment was made.

Editors and Publishers: Abstracts or digests of articles not exceeding 400 words may be published, duly credited to the author and JOURNAL OF COSMETIC SCIENCE, the Official Journal of the Society of Cosmetic Chemists. Authors: When using illustrations or quotations taken from copyrighted publications, authors must get written permission from the copyright holder to reproduce the same.

Page Changes: The authors of a manuscript will no longer be assessed a page charge for printed manuscripts. The author will still be responsible for the cost incurred for the printing of color photographs. Any material set into type but ordered deleted from the publication at the page proof stage must also be paid for by the author. These changes will be invoiced to the senior author at the time of publication.

MANUSCRIPTS: Manuscripts should be prepared in accordance with "Information for Authors," which can be found at the end of this issue.

Periodicals postage paid at New York, New York and additional mailing offices.

Purchassidiity for Sector 14 Wall Stree Chemists, the Journal Advisory Group and the Board of Directors assume From: SCC Media Library & Resource Center (library.scconline.org)

Publication office: 14 Wall Street, Suite 1620, New York, NY 10005 (212) 668-1500, Fax: (212) 668-1504.

formulating science &

Driving the science and business of cosmetics forward.

At the University of Cincinnati, our approach to cosmetic science is for inventors and explorers. For those ready to make an impact in one of the fastest growing and increasingly science-driven fields. Our innovative programs help prepare students today to gain knowledge that will help them develop as industry leaders for tomorrow. ONLINE PROGRAM OPTIONS:

Master of Science in Cosmetic Science

Graduate Certificate in Cosmetic Science



University of CINCINNATI ONLINE

LEARN MORE AT ONLINE.UC.EDU/PROGRAMS/PHARMACY/

Purchased for the exclusive use of nofirst nolast (unknown) From: SCC Media Library & Resource Center (library.scconline.org)



Journal of Cosmetic Science

The Official Journal of the Society of Cosmetic Chemists Volume 73 No. 3 | May/June 2022

SOCIETY OF COSMETIC CHEMISTS

ORIGINAL ARTICLES

A New Alternative for Acne Treatment: Plaster Containing Benzoyl Peroxide–Loaded Microsponges

Nihal Atabay, Ayşe Merih Sariisik, Sinem Yaprak Karavana and Seda Rencber | pp. 114

Physalis angulata Cream for Reducing Inflammatory Effects of Intense Pulsed Light Treatment for Solar Melanosis

Glaucia Rodrigues Cardoso, Paula Montanhini Favetta, Julieta Rahal Cardoso Barucci, Irinéia Paulina Baretta, Emerson Luiz Botelho Lourenço, Odair Alberton and Ricardo de Melo Germano | pp. 126

Formulation Development of Sustained-Release Microencapsulated IR3535® with Long-Duration Mosquito Repellency

Eduard Casas-Terradellas, Emma Bebbington, Tycho Speaker and Thomas P. Dooley | pp. 140

The Antipigmentation and Antioxidant Activity of Sanchi Flower Extract

Juan Wang, Peiyu Wang, Xue Shao, Tong Huo, Jitao Liu, Qianghua Quan and Quan An | pp. 154

Development and Validation of HPLC Method for Determination of Four UV Filters in Sunscreen Products

Sumit Tiwari, Vishal Sareen, Yamini Sharma, Deepali Prashar, S.K. Luthra, Prasun Bandyopadhyay and Ranjan Mitra | pp. 166

REVIEW ARTICLE

The Safety and Efficacy of Petrolatum

Carol A. Bosko, Jean Adamus and John S. Bajor | pp. 178

Erratum Notice from Vol 73 No. 2

G. Gedik and T. Uğurlu | pp. 188