ISSN: 2689-5153

VOLUME 71 NO. 1 YEAR 2020

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

75 YEARS

SOCIETY OF COSMETIC CHEMISTS

SERVING GREATER NORTH AMERICA SINCE 1945

WWW.SCCONLINE.ORG/JOURNAL

Purchased from Scholarly Stock Photo Nationalist (unknown)
From: SCC Media Library & Resource Center (library.scconline.org)

Genworth

Stay.

Why leave your home and everything you love just because you need long term care?

There are solutions available that cover in-home care, so you can get the help you need in the place you love most.

Best of all, that coverage may be more affordable than you think.

Visit **genworth.com/SOCC** to learn more.

347602-A 08/20/19

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

SOCIETY OF COSMETIC CHEMISTS
SERVING GREATER NORTH AMERICA SINCE 1945

Journal of Cosmetic Science

The Official Journal of the Society of Cosmetic Chemists

Journal Editor: **Paolo Giacomoni, PhD,** Consultant to the Skin Care Industry

Associate Editor: **Trefor Evans, PhD**, TRI-Princeton | *Hair Expert*

K.P. Ananthapadmanabhan, PhD, College of Pharmacy, University of Cincinnati | *Skin Expert*

President: **Mindy Goldstein, PhD**, Mindy S. Goldstein, PhD Consulting

Vice President: **Liz Streland**, Croda, Inc.

Vice President-Elect: **Michelle Hines, PhD**, Mary Kay, Inc.

Secretary: **Yulia Park, PhD**, Amway Corporation

Treasurer: **Mark Chandler**, ACT Solutions Corporation

Executive Director/CEO: **Erica L. O'Grady, CAE**, Society of Cosmetic Chemists HQ

© Copyright 2020 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.

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.
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.
RESPONSIBILITY FOR STATEMENTS PUBLISHED: The Society of Cosmetic Chemists, the Journal Advisory Group and the Board of Directors assume no responsibility for statements or opinions advanced by contributors to this Journal.
Missing issues 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 or color photograph charge for printed manuscripts. 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.

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

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

100% BIO-BASED ECO RANGE *of Surfactants*

Turning the WORLD'S PRODUCTS GREEN

Sustainability is an integral part of our Business, informing and guiding our development strategies. The 100% Bio-Based ECO Range is the widest range of 100% renewable surfactants on the market. By using an alternate route to EO with bioethanol from biomass sources, it significantly increases the bio-based content of ethoxylated products and reduces reliance on fossil fuels. Moreover, the ingredients are manufactured with renewable energy.

With the 100% renewable, 100% Bio-based ECO Range, you won't have to choose between meeting your sustainability goals and delivering high performance products to your consumers.

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

100% Renewable, 100% Bio-Based Options from Croda
ECO Range

- 100% renewable
- 100% bio-based[1]
- Reduces reliance on fossil fuel feedstocks
- Manufactured with renewed energy
- Performance identical to petro-based versions
- Lower carbon footprint than petro-based versions
- Tested and Registered to the USDA BioPreferred® Program[2]
- RSP Supply Chain Certified via Mass Balance[3]

1. Calculated using USDA BioPreferred Method for determining bio-based content and validated, or being validated by carbon 14 testing (ASTM D6866)
2. USDA BioPreferred is a registered trademark of the U.S Department of Agriculture
3. Products containing palm oil derivatives are RSPO Supply Chain Certified via Mass Balance

Smart Science to Improve Lives™

CRODA

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

SOCIETY OF COSMETIC CHEMISTS
SERVING GREATER NORTH AMERICA SINCE 1945

Journal of Cosmetic Science

The Official Journal of the Society of Cosmetic Chemists
Volume 71 No. 1 | January/February 2020

ORIGINAL ARTICLES

Improved Stability of Butterfly Pea Anthocyanins with Bipolymeric Walls

Nattaya Lourith, Mayuree Kanlayavattanakul | pp. 1

A New, Rapid Method for Examining Potential Skin Brightening Ingredients Using Apple Slices

James V Gruber, Jed Riemer | pp. 11

Stability and Release Kinetics of Natural Oil Microemulsions Containing Nicotinamide

Nang Hnin Ei Hlaing, Natthida Pakpayat, Prapaporn Boonme | pp. 23

Luxury Cues Facilitate the Connection Between Social Dominance and Reward Mediated by the Lateral Prefrontal Cortex

Naoyasu Hirao, Madoka Noriuchi, Hiroko Isobe, Yoshiaki Kikuchi | pp. 37

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

International Hair Importers & Products

KNOWING WHAT 'QUALITY' OF HAIR MEANS TO
CHEMISTS IS WHAT WE ARE ALL ABOUT!

WE SUPPLY HAIR SPECIFICALLY FOR ALL YOUR NEEDS. . .
FROM REAL VIRGIN NATURAL WHITE HAIR TO
MICROSCOPICALLY EVALUATED HAIR

WE ARE THE ONLY COMPANY WITH PATENTS*
COVERING THE SWATCHING PROCESS

OUR PRICING, SERVICE, AND ATTENTION TO DETAIL
WILL MAKE CHOOSING AND ORDERING
THE HAIR YOU NEED A BREEZE

CONTACT US AT:

INTERNATIONAL HAIR IMPORTERS & PRODUCTS
87-29 Myrtle Avenue
Glendale, New York 11385
Tel: (718) 850-3767 Fax: (718) 850-3653
Email: ihip@aol.com

*US Patents 5,875,788 • 6,000,406 • 6,085,755

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