

AMERICAN CERAMIC SOCIETY

Bulletin

emerging ceramics & glass technology

DECEMBER 2013
www.ceramics.org

*ceramic***SOURCE**

REFERENCE & BUYER'S
RESOURCE DIRECTORY



- Accelerating new materials discovery •
- Improving LCC flowability •
- Meeting previews: EMA'13, ICACC'13, MCARE'13 •
- Unitecr highlights •

contents

December 2013 • Vol. 92 No. 9

feature articles

Accelerating functional materials discovery 14

James M. Rondinelli, Nicole A. Benedek, Danna E. Freedman, Abby Kavner, Efrain E. Rodriguez, Eric S. Toberer, and Lane W. Martin

Insights from geological sciences, data-driven approaches, and computational advances.

Improving flowability of low-cement castable refractories using fine-ground alumina 23

E. Chabas, C. Ulrich, and P. Caneri

A new calcined alumina has good flowability and may be an economical alternative to some reactive aluminas in refractory LCC formulations.

meetings

Unitec 2013 highlights 25

Electronic Materials and Applications (EMA) 2014 26

38th International Conference and Exposition on Advanced Ceramics and Composites (ICACC) 28

ceramicSOURCE 2013–2014

PRODUCTS & SERVICES DIRECTORY 33

Indexes

Advertiser Index	35
Product/Service Index	35
Geographic Index: United States	39
Geographic Index: International	41

Products & Services Directories

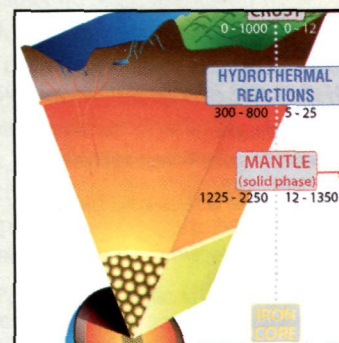
Clay & Natural Minerals	42
Ceramic & Metallic Powders & Materials	44
Additives	55
Materials Preparation, Handling & Packaging	57
Fabricating & Finishing	62
Decorating	66
Drying, Firing & Melting	69
Refractories	79
Testing/Evaluation Instruments & Equipment	85
Laboratory Equipment & Supplies	86
Consultants & Services	88
Custom Ceramics Fabrication & Engineering Services	92
Education & Resources	96
Laboratory Services	96
Plant Construction, Design & Engineering	98
Research Organizations	99
Advanced Structural & Technical Ceramics	100
Artware	105
Construction Ceramics	105
Dinnerware	105
Electrical/Electronic Ceramics	105
Glass Products	108
Porcelain Enamel	110

Company Directory 111



cover story

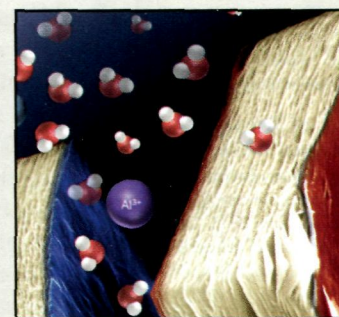
ceramicSOURCE products and services directory 2013–2014
– page 33



Accelerating functional materials discovery

(Credit: Rondinelli, Freedman, Kavner.)

– page 14



research briefs

High-density energy storage by intercalation of MXene phase layers

(Credit: Drexel University.)

– page 12

Editorial and Production

Eileen De Guire, Editor

ph: 614-794-5828 fx: 614-794-5815
edeguire@ceramics.org

Jim Destefani, Associate Editor

ph: 614-794-5853 fx: 614-794-5813
jdestefani@ceramics.org

Russell Jordan, Contributing Editor

Tess Speakman, Graphic Designer

Editorial Advisory Board

Andrew Gyekenyesi, Chair, Ohio Aerospace Institute

Finn Giuliani, Imperial College London

G. Scott Glaesemann, Corning Incorporated

C. Scott Nordahl, Raytheon Company

Joe Ryan, Pacific Northwest National Laboratory

Rafael Salomão, University of São Paulo

Eileen De Guire, Staff Liaison, The American Ceramic Society

Customer Service/Circulation

ph: 866-721-3322 fx: 240-396-5637
customerservice@ceramics.org

Advertising Sales

National Sales

Patricia Janeway, Associate Publisher

pjaneway@ceramics.org
ph: 614-794-5826 fx: 614-794-5822

Europe

Richard Rozelaar

media@alaincharles.com
ph: 44-(0)-20-7834-7676 fx: 44-(0)-20-7973-0076

Executive Staff

Charles Spahr, Executive Director and Publisher

cspahr@ceramics.org

Teresa Black, Director of Finance and Operations

tblack@ceramics.org

Megan Bricker, Dir. Marketing & Membership Services

mbricker@ceramics.org

Eileen De Guire, Director of Communications

edeguire@ceramics.org

Sue LaBute, Human Resources Manager & Exec. Assistant

slabute@ceramics.org

Mark Mecklenborg, Dir. Technical Publications & Meetings

mmecklenborg@ceramics.org

Officers

David Green, President

Kathleen Richardson, President-elect

Richard Brow, Past President

Ted Day, Treasurer

Charles Spahr, Executive Director

Board of Directors

Keith Bowman, Director 2012-2015

Elizabeth Dickey, Director 2012-2015

John Halloran, Director 2013-2016

Vijay Jain, Director 2011-2014

Edgar Lara-Curzio, Director 2013-2016

Tatsuki Ohji, Director 2013-2016

Ivar Reimanis, Director 2011-2014

Lora Cooper Rothen, Director 2011-2014

Mrityunjay (Jay) Singh, Director 2012-2015

David Johnson Jr., Parliamentarian

Address

600 North Cleveland Avenue, Suite 210
Westerville, OH 43082-6920



departments

News & Trends 3

- Refractory TTT: Top ten takeaways from Unitec 2013
- IBM's Watson unchained for materials discovery
- GT Advanced Technologies to grow sapphire crystals for Apple
- Cement, concrete sustainability a hot topic
- Rotary engine materials, applications reimaged

ACerS Spotlight 7

- Society award nomination deadlines: Jan. 15, 2014
- Important change to Purdy award rules
- ACerS/Wiley Download Direct: A valuable member benefit
- December JAGS focuses on glass corrosion
- Education Integration Committee: PCSA materials science demo kits
- Pittsburgh Section golf outing

Ceramics in the Environment 10

- New approach to 'mining'—Extracting glassmaking raw materials from food waste

Ceramics in Energy 11

- Nanowire breakthrough could lead to roll-out solar panels, flexible electronics
- Reduced firing temperatures, low-e kiln design to save energy, cut emissions

Research Briefs 12

- High-density energy storage by intercalation of MXene phase layers
- Shape memory and superelasticity in zirconia

Ceramics in Biomedicine 13

- Iron oxide-based nanoparticles detect, diagnose, destroy cancer
- Ceria nanoparticles show promise in fight against bacteria

columns

Deciphering the Discipline 32

Eric Teller
My English experience

resources

Calendar 30

Classified Advertising 31

Display Advertising Index 35

American Ceramic Society Bulletin covers news and activities of the Society and its members, includes items of interest to the ceramics community, and provides the most current information concerning all aspects of ceramic technology, including R&D, manufacturing, engineering, and marketing.

American Ceramic Society Bulletin (ISSN No. 0002-7812). ©2013. Printed in the United States of America. ACerS Bulletin is published monthly, except for February, July, and November, as a "dual-media" magazine in print and electronic formats (www.ceramicbulletin.org).

Editorial and Subscription Offices: 600 North Cleveland Avenue, Suite 210, Westerville, OH 43082-6920. Subscription included with American Ceramic Society membership. Nonmember print subscription rates, including online access: United States and Canada, 1 year \$95; international, 1 year \$150.* Rates include shipping charges. International Remail Service is standard outside of the United States and Canada. *International nonmembers also may elect to receive an electronic-only, email delivery subscription for \$75.

Single issues, January–October/November: member \$6.00 per issue; nonmember \$7.50 per issue. December issue (ceramicSOURCE): member \$20, nonmember \$25. Postage/handling for single issues: United States and Canada, \$3 per item; United States and Canada Expedited (UPS 2nd day air), \$8 per item; International Standard, \$6 per item.

POSTMASTER: Please send address changes to American Ceramic Society Bulletin, 600 North Cleveland Avenue, Suite 210, Westerville, OH 43082-6920.

Periodical postage paid at Westerville, Ohio, and additional mailing offices. Allow six weeks for address changes.

ACSBA7, Vol. 92, No. 9, pp 1–150. All feature articles are covered in Current Contents.