

AMERICAN CERAMIC SOCIETY BULLETIN

THE WORLD RESOURCE FOR CERAMIC MANUFACTURING AND TECHNOLOGY

April 2003
www.ceramicbulletin.org
Official Program Issue

Today's Research for Tomorrow's Technology The 105th Annual Meeting & Exposition

- Honors & Awards / 66
- Plenary Lectures / 109
- Calendar of Events / 113
- Technical Programs / 117
- Planning Grid / 145
- Exhibit-in-Print & Expo Directory / 78

Nanotechnology / 31

Gelcasting Review / 43

Characterizing Defects / 39

Lithium in Ceramics / 61

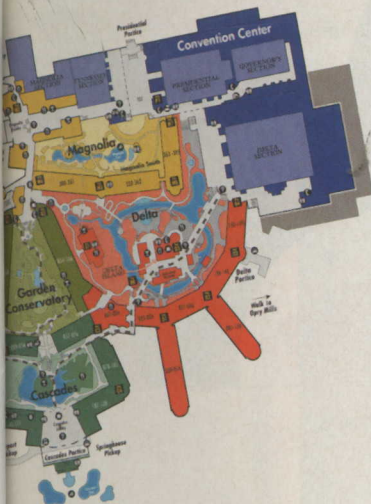


CONTENTS

Volume 82 Number 4, April 2003

feature articles

- 31 **Nanotechnology—It's More Than Size**
The world market for nanotechnology-related products and services will reach \$1 trillion by 2015.
Patricia A. Janeway, Editor
- 39 **Characterization of Large Defects in Alumina**
Optical microscopy and SEM are used in a new method for determining large defects in alumina.
K. Sato, S. Tanaka, N. Uchida, K. Uematsu, H. Abe, M. Naito, T. Hotta and N. Shinohara
- 43 **Gelcasting Ceramics: A Review**
An overview of direct consolidation forming techniques, their comparison with traditional wet- or paste-processing forming techniques and selection criteria.
Giuliano Tari
- 47 **Seven-Component Lead-Free Frit Formulation**
Formulation of a transparent frit used for ceramic tile.
Luciana Maccarini Schabbach, Antonio Pedro Novaes de Oliveira, Márcio Celso Fredel and Dachamir Hotza
- 51 **Effect of Polymeric Fibers on Refractory Castable Permeability**
Polypropylene fibers were added to a castable to determine their effects on permeability and porosity.
R. Salomão, F.A. Cardoso, M.D.M. Innocentini, V.C. Pandolfelli and L.R.M. Bittencourt
- 57 **Effects of Machining on Si_3N_4 Strength**
Extent and effect studies established an improved method of evaluating inherent material strength for evolving automotive applications.
Biljana Mikijelj and Richard Allor
- 61 **Lithium in Ceramics**
The application of lithium in ceramics goes beyond its recognized properties of thermal stability, high fluxing capability and improved viscosity.
Charles Merivale



105th annual meeting . . .



lithium in ceramics . . .



105th annual meeting & exposition

- 78 2003 R&D Laboratory Exhibit-in-Print/Expo Directory
- 109 Plenary Lectures
- 110 Short Courses
- 113 Calendar of Events
- 117 Technical Program
- 125 Companion Program
- 140 Student Activities
- 142 Meeting Registration Form

American Ceramic Society Bulletin is covered in Current Contents.

The American Ceramic Society assumes no responsibility for the statements and opinions advanced by the contributors to its publications or by the speakers at its programs. Registered names and trademarks, etc., used in this publication, even without specific indication thereof, are not to be considered unprotected by the law.

No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form by any means, electronic, mechanical, photocopying, recording or otherwise, without the written permission of the publisher. Permission is not, however, required to copy abstracts of papers or articles on the condition that a full reference to the source is given.

Authorization to photocopy items for internal or person use beyond the limits of Section 107 or 108 of the U.S. Copyright Law, is granted by The American Ceramic Society, ISSN 0002-7812, provided that the appropriate fee is paid directly to Copyright Clearance Center Inc., 222 Rosewood Drive, Danvers, MA 01923 USA; tel. 978-750-8400; Internet www.copyright.com. Prior to photocopying items for educational classroom use, please contact Copyright Clearance Center Inc.

This consent does not extend to copying items for general distribution or for advertising or promotional purposes, or to republishing items in whole or in part in any work in any format. Please direct republication or special copying permission requests to the Senior Director, Publications, The American Ceramic Society, P.O. Box 6136, Westerville, OH 43086-6136 USA.

Orders for copies of articles published in this publication may be placed through customer service at The American Ceramic Society, tel. 614-794-5890, fax 614-794-5892.

Custom reprints, in quantities of 100 or more, may be purchased through the *Bulletin's* editorial department. Requests for reprint quotes should be directed to Pat Janeway, tel. 614-794-5826, fax 614-794-5822.

Instructions for the preparation of articles to be submitted for possible publication in this periodical are available from the Editor: tel. 614-794-5826, fax 614-794-5822, E-mail pjaneway@acers.org, or on the Internet at www.ceramicbulletin.org.

Cover

Design by Tess Speakman.



www.ceramicbulletin.org

CONTENTS

news & views

- 11 **president's letter**
A Strategy for Change
Gary L. Messing, President
- 13 **global news**
Ballistics Mystery/17
Zemex to Sell/19
Hip Replacement/23
- 15 **technology briefs**
Greg Geiger, Technical Editor
- 18 **nano news**
- 22 **refractory hot line**
Charles G. Marvin, Contributing Editor
- 160 **editorial/last page**
Let the Show Begin
Patricia A. Janeway, Editor



global news . . .

departments

- 5 **calendar** 149 **business services**
- 16 **business stats** 158 **career opportunities/classified ads**
- 27 **names in the news** 159 **information please/ad index**

society business

- 20 **section notes**
- 66 **honors and awards**
- 91 **books**



global news . . .

AMERICAN CERAMIC SOCIETY BULLETIN COVERS NEWS AND ACTIVITIES OF THE SOCIETY AND ITS MEMBERS, INCLUDES ITEMS OF INTEREST TO THE CERAMIC COMMUNITY, AND PROVIDES THE MOST CURRENT INFORMATION CONCERNING ALL ASPECTS OF CERAMIC TECHNOLOGY, INCLUDING RESEARCH AND DEVELOPMENT, MANUFACTURING, ENGINEERING AND MARKETING.

AMERICAN CERAMIC SOCIETY BULLETIN (ISSN No. 0002-7812). ©2003 PUBLISHED MONTHLY, 12 TIMES A YEAR. PRINTED IN THE UNITED STATES OF AMERICA.

EDITORIAL AND SUBSCRIPTION OFFICES: P.O. Box 6136, WESTERVILLE, OH 43086-6136. SUBSCRIPTION INCLUDED WITH AMERICAN CERAMIC SOCIETY MEMBERSHIP. NONMEMBER SUBSCRIBER RATES: NORTH AMERICA, 1 YEAR \$50; INTERNATIONAL (AIR MAIL ONLY), 1 YEAR \$100. BACK ISSUES: NORTH AMERICA, \$9 PER ISSUE; INTERNATIONAL, \$12 PER ISSUE. ALL RATES INCLUDE SHIPPING CHARGES. OUR STANDARD DELIVERY METHOD OUTSIDE NORTH AMERICA IS VIA BULK AIR MAIL PROVIDED BY AN INTERNATIONAL RE-MAIL CARRIER.

POSTMASTER: PLEASE SEND ADDRESS CHANGES TO AMERICAN CERAMIC SOCIETY BULLETIN, P.O. Box 6136, WESTERVILLE, OH 43086-6136.

PERIODICAL POSTAGE PAID AT WESTERVILLE, OHIO, AND ADDITIONAL MAILING OFFICES. ALLOW SIX WEEKS FOR ADDRESS CHANGES. ACSBA7, VOL. 82, No. 4, pp 1-160