
Minnesota Microscopy Society

Local affiliate of the *Microscopy Society of America*
and the *Microbeam Analysis Society*



Newsletter

March 2000

MMS March Meeting

MMS Joint Meeting with the American Society of Metals (ASM)

Wednesday, March 22, 2000

Microstructure-Property Relationships in Ceramic Fibers

Speaker: David M. Wilson, Research Specialist
3M, Metal Matrix Composites
St. Paul, Minnesota

David Wilson has over 15 years of research and development experience in the synthesis of new ceramic fibers and other novel materials using sol-gel techniques, and is the inventor of the Nextel™ 610 and 720 Ceramic Oxide Fibers. His experience includes the development of novel fiber precursor formulations and continuous process, testing, and characterization of ceramic fibers at room and elevated temperatures. He holds five patents and Bachelor and Master of Science degrees in Ceramic Engineering from the University of Illinois, Urbana.

Program: 6:00-6:30 PM Social Hour
6:30-7:00 PM Dinner
7:15-8:00 PM Technical Program

Location: St. Louis Park VFW Hall
5606 West 36th St.
(Corner of Hwy. 100 and West 36th St.)

Make reservations by calling the ASM office at 612-522-4770, or do it over the web at:
www.freenet.msp.mn.us/org/mnasm/reserv.htm

Abstract:

Commercial polycrystalline oxide fibers are produced by spinning and pyrolyzing chemically derived precursors. The chemical process approach is also commonly called sol/gel processing. The use of chemical processing allows the preparation of fibers from alumina with high temperature properties not accessible by traditional approaches such as spinning molten glasses. Spun fibers are heat treated to develop a ceramic microstructure with both good strength and good resistance to degradation at high temperature. A key characteristic of reinforcement fibers is their ultra-fine or even nanoscale microstructure; a grain size below 0.2 μm is optimal for high strength.

Processing issues and microstructural design that allow the achievement of high fiber strength will be discussed. For example, Nextel™ 610 fibers have a tensile strength of 3.0 GPa, significantly higher than other commercially available oxide fibers. This strength results from the development of nucleating agents capable of forming 0.1 μm grains, plus an intensive flaw-elimination program guided by fractographic examination. Statistics on the single filament strength and variability of Nextel™ 610 ceramic fibers will be presented and correlated with the strength of fiber reinforced epoxy and aluminum composite wires.

(Abstract continues on page 2)

Abstract (continued from page 1)

Microstructural design in fibers targeted at high temperature applications will also be discussed. Over the last ten years, many new oxide fibers with dramatically improved high temperature performance have been developed. The key to the improvement has been the development of crystalline fibers with high contents of creep-resistant crystalline phases, and the elimination of amorphous phases that allow rapid, viscous deformation under load at high temperatures. Examples of fibers with improved high temperature strength and creep resistance include rare earth doped polycrystalline Al_2O_3 , yttria-alumina-garnet (YAG) and mullite fibers.

Project Micro

This years ScienceFest at the Bell Museum is on Saturday March 4th from 10:00 until 3:00 PM. We will be in a slightly different location in the Bell Museum, but otherwise we will be putting on the same presentation as before. We need a few more volunteers - no previous experience is necessary. Please consider signing up; in the past those taking part (the kids and the volunteers) have enjoyed themselves tremendously and we are very much appreciated by the Bell Museum staff.

Please respond to Stuart McKernan (stuartm@tc.umn.edu or (612) 624-6009), if you can help, or if you would like more details.

Upcoming MMS Meetings

May 4 Spring Symposium

Upcoming National Meetings**Scanning 2000**

Date: May 9 - 12, 2000
Location: Sheraton Four Points Riverwalk Hotel
 San Antonio, Texas
Sponsor: FAMS, Inc. (Foundation for the
 Advances in Medicine and Science)
 and *SCANNING, The Journal of
 Scanning Microscopies*.
Contact: Mary K. Sullivan, SCANNING 2000
 201-818-1010; scanning@fams.org, or
 www.scanning.org

IUMAS 2000

Date: July 8-15, 2000
Location: Kona, Hawaii
Sponsor: International Union of Microbeam
 Analysis Societies
Contact: David B. Williams, Lehigh University,
 215-758-4224; DBW1@lehigh.edu

Microscopy and Microanalysis 2000

Date: August 13 -17, 2000
Location: Philadelphia, Pennsylvania
Sponsor: Microscopy Society of America and
 Microbeam Analysis Society
Contact: MSA Business Office: 800-538-3672
 www.msa.microscopy.com

Get Your News into this Space

The Minnesota Microscopy Society is looking for contributions for its newsletter. These contributions can be either news items or short articles on a technical topic that would be of general interest to the Society's members. Does your company have a new product or a new sales representative for this area? If you have news that would be of interest to MMS members, send it to the Newsletter Editor, Peter McSwiggen, University of Minnesota, Department of Geology & Geophysics, 310 Pillsbury Drive SE, Minneapolis, MN 55455, or e-mail it to: mcswi001@tc.umn.edu

Microscopy Community News

Interested in Antique Microscopes? Check out these sales events !

These are buy, sell, and trade fairs and include many categories of scientific instruments.

9th Semi-Annual Antique Scientific Instrument Fair Somerset, New Jersey

Date: Sunday, March 26, 2000

Time: 9:30 AM to 3:00 PM

Contact: Marvin Hurwitz, 301-384-1394 or
Conrad Schure, 732-431-5191

6th Annual Antique Science & Technology Show and Swap, Dallas/Ft. Worth

Date: Saturday, April 29, 2000

Time: 10 AM to 4 PM

Contact: Skip Solberg, 717 Salsbury Circle,
Arlington, TX 76014.
Phone: 817-467-0368.
e-mail: solberg@airmail.net.

(From: Journal of the Microscope Historical Society,
Vol. 7, no. 3, Winter 1999/2000 via Devora Molitor)

New High Performance Scintillator: ITO-GOLD™

From M.E. Taylor Engineering

M.E. Taylor Engineering, Inc., a U.S. based manufacturer of high quality and custom made microscopy accessories, announces the availability of its newest product: ITO-GOLD™ Scintillators (pronounced Eye-Two Gold). These scintillators are plated with conductive, transparent indium-tin oxide to which a gold plated ring is bonded before their P47 is deposited. This treatment enhances electrical contact, resulting in a reduction of signal to noise ratio and eliminated the need for aluminum coating. ITO-Gold™ Scintillators are easier to handle during installation and are re-coatable. For more information contact M.E. Taylor Engineering at 301-975-9798 or their web site.

(For links see the MMS web site.)

American Ceramics Society Minnesota Student Section *Spring Workshop*

Topic: Mechanics and Characterization of Ceramics
Date: April 10, 2000.

Invited speakers include:

Ian Anderson - Oak Ridge National Laboratory
David Marshall - Rockwell International
Joe Michael - Sandia National Laboratory
Shun Karato - University of Minnesota
David Kohlstedt - University of Minnesota

The aim of this workshop is to bring together an interdisciplinary group of materials scientists to discuss recent advances in the characterization of ceramics.

This is an all day seminar series and includes breakfast and lunch. Prices are:

Industry - \$200, U of MN Faculty - \$150,
Student - \$75.

We are offering reduced fees for advanced registration: Industry - \$175, U of MN Faculty - \$125.

Please set this date aside on your calendar. More information will become available in the following weeks. If you have any specific questions, you can contact Sarah Efflandt at efflandt@cems.umn.edu.

Sustaining Members

Sustaining members are the backbone of financial support for the Society. These members make it possible for the Society to support Project Micro, and to cover many of the expenses of the regular meetings and the Spring Symposium. We greatly appreciate the continued support of these individuals and corporations. To become a Sustaining member, fill out the MMS membership form at the end of the newsletter.

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John Treadgold	LEO Electron Microscopy Inc.	847-290-9566

If any Sustaining members are missing from this list, *please* contact either: Diana Kittleson (651-917-5859, dkittleson@pillsbury.com) or Peter McSwiggen (612- 624-7370, mcswi001@tc.umn.edu)

MMS Patron Members

The Minnesota Microscopy Society would like to express our thanks to our Patron members. These members provide financial support to the organization above the standard membership dues level. This type of continued support makes it possible for MMS to maintain its financial well being. To become a Patron member, fill out the MMS membership form at the end of the newsletter.

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Your MMS Annual Membership dues are payable in September/October!

All microscopists are urged to support their Society at one of the membership levels offered below. The more dues-paying members we have, the more likely we are to attract sustaining corporate memberships which form the financial backbone of our Society. Often, supervisors will support MMS memberships out of their project budget because they recognize that it is a very inexpensive way to maintain and increase the skills of their microscopists. If you have been a member over the years and recognize the value of MMS to the community of microscopists it serves, consider upgrading your membership this year to the patron or sustaining level. Thank you.

Name _____ Dr _____ Mr _____ Ms _____ Phone (____) _____

Affiliation _____ Position _____

Address _____ ZIP _____

Indicate the method by which you would like to receive the Newsletter: mail _____ e-mail/web _____ both _____

Check here _____ if you do NOT want your name and address to appear in the Society directory.

Are you an MSA Member? _____ MAS Member? _____ Other Professional groups? _____

Area of interest: Bioscience _____ Materials Science _____ SEM _____ TEM _____ X-ray _____

Basic \$10 _____ Patron \$25 _____ Sustaining \$100 _____ Student \$5 _____

**Make checks payable to MMS and mail to our treasurer:
Dwight Erickson, MMS Treasurer, 3M Center, Bldg. 251-1A-03, Saint Paul, MN 55144-1000.**

Minnesota Microscopy Society
Peter McSwiggen, MMS Editor
University of Minnesota
310 Pillsbury Drive, SE,
Minneapolis, MN 55455

**March 22, 2000:
"Microstructure-Property
Relationships in Ceramic Fibers"**

Forwarding and Address
Correction Requested