



ISOTOPICS

The Cleveland Section of the American Chemical Society

Volume 84 Issue 6

September 2008

On Deck:

Wednesday, October 15

Speaker: TBD

Venue: TBD

September Meeting Notice

Wednesday, September 17, 2008

John Carroll University, Dolan Science Center

4:30 pm	Executive Committee Meeting
5:30 pm	Social Time
6:30 pm	Dinner
7:30 pm	Lecture

Low Temperature Carburization of Austenitic Stainless Steels

Sunniva R. Collins, Ph.D. – Senior Research Fellow, Swagelok Company

Low-temperature colossal supersaturation (LTCSS) is a novel diffusional surface hardening process for carburization of austenitic stainless steels and other alloys without the precipitation of carbides. The formation of carbides is kinetically suppressed, enabling extremely high or colossal carbon supersaturation. As a result, surface carbon concentrations in excess of 12 at.% are routinely achieved. This treatment increases the surface hardness by a factor of four to five, improving resistance to wear, corrosion, and fatigue, with significant retained ductility.

LTCSS provides a uniform and conformal hardened gradient surface with a hardness layer is at least 25 μ m thick, with a near surface hardness of \approx HV1200 (over 70 HRC). The thickness of the hardened layer can be increased further by additional carburization treatments. In addition, because parts are treated at low temperature, they do not distort or change dimensions. In addition to austenitic stainless steels, research efforts are underway to extend the technology to other industrially important alloys, such as precipitation-hardening stainless steels, duplex alloys, nickel-based alloys, and cobalt-based alloys.

This talk will describe the technology, and will discuss research findings from a recent U.S. Department of Energy project that quantified the performance improvements for treated materials.

DINNER RESERVATIONS REQUIRED: Please RSVP by contacting David Ball, by phone at 216-687-2456 or by e-mail at d.ball@csuohio.edu by **5 pm on Friday, September 12** (For phone reservations, please clearly spell your last name and leave a return phone number). Cost of the dinner is \$20 for members & guests and \$10 for students. Checks made out to "Cleveland ACS" are greatly appreciated.

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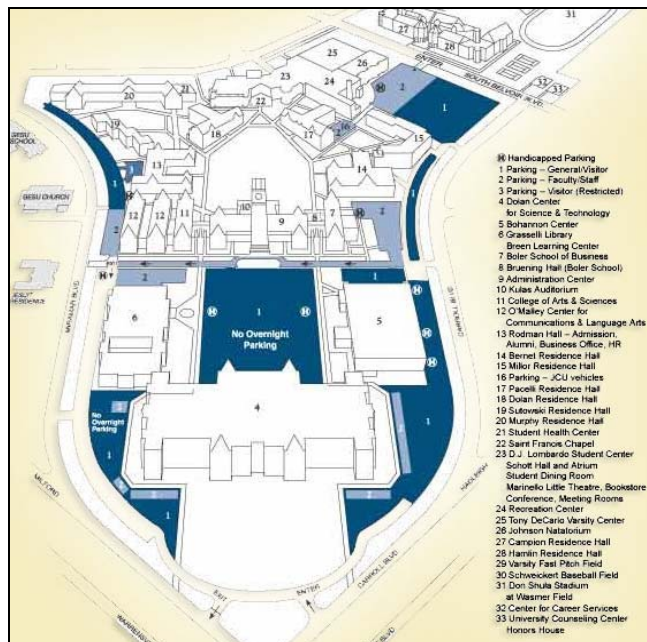
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Directions to John Carroll University



From I-271: Take I-271 to Exit 32 (Cedar/Brainard Roads). Follow Cedar Road west for 2.5 miles to South Belvoir Blvd. Turn left onto South Belvoir and travel south 0.7 miles. The entrance to campus will be on your right after crossing Washington Blvd. The Dolan Science Center is highlighted on the map below.

For directions from other locations, please see: www.jcu.edu/map.htm. For the campus map, see: http://www.jcu.edu/pubaff/ABOUTJCU/campus_map.htm.

Speaker Bio

As senior research fellow at Swagelok Company, Sunniva R. Collins is responsible for coordinating the company's academic and governmental research partnerships. She joined Swagelok in 1995 as a research metallurgist and has served in engineering management positions including manager, standards and product regulatory compliance. Most recently, Collins acted as the technical director of Swagelok Technology Services Company, a wholly owned subsidiary of Swagelok Company.

Collins received her doctorate and master's degree in materials science and engineering from Case Western Reserve University and her

bachelor's degree from the University of Michigan. She was Swagelok's Principal Investigator on a three-year DoE-funded project to evaluate low temperature colossal supersaturation (LTCSS, now being commercialized by Swagelok as the SAT 12 process), which completed at the end of 2006. On this project, she was responsible for program management of collaborative research with Case Western Reserve University (CWRU), Oak Ridge National Laboratory (ORNL) and other industry partners. The results of this research have been outstanding, and contributed significantly to Swagelok's recognition by ASM with the 2006 ASM Engineered Materials Achievement Award for LTCSS.

Dr. Collins has worked to develop key standards on welding, surface finish requirements, and corrosion test methods for the semiconductor equipment industry. She has also instructed courses for ASME on Bioprocessing Equipment (BPE) and for the International Society of Pharmaceutical Engineers (ISPE). Collins is active in ASM International and was the Cleveland Chapter Chair from 2000 to 2001. She is listed in *Who's Who in America*, *Who's Who in Science and Engineering*, and *Who's Who in American Women*.

National Chemistry Week

By Bob Fowler

Again this year the Cleveland Section is sponsoring National Chemistry Week in October. This is a program of fun experiments for children in grades 2-5 to introduce them to the world of chemistry. We are in need of volunteers to assist us in assembling kits for these experiments on Saturday, Sept. 20 at JCU. If you have a few hours to spare, please email either Bob Fowler at fowler@en.com or Kat Wollung at katkat@neo.rr.com. You'll enjoy it!!

Call for Nomination: The Edward W. Morley Medal

By Kenneth W. Street

The Cleveland Section annually sponsors a regional award, which consists of the Morley Medal and an honorarium of \$2,000. The next presentation of the Morley Medal will take place at the meeting of the Central Regional Meeting of the ACS at the Morley Award Symposium on Thursday, May 21, 2009. The Edward W. Morley lecture will be a part of the symposium and the award will be presented at a banquet that evening. Travel expenses for the medalist and spouse or significant other will be provided.

The purpose of the award is to recognize significant contributions to chemistry through achievements in research, teaching, engineering, research administration and public service, outstanding service to humanity, or to industrial progress.

The area of eligibility includes those parts of the United States and Canada within about 250 miles of Cleveland. The contributions for which the award is given should have been made by the awardee when a resident of this area, or if a major contribution was made elsewhere, the nominee should have continued to make contributions while a resident of this area. Nominations may be made by any member of the American Chemical Society, The Chemical Society or the Chemical Institute of Canada.

Nominations for the Morley Medal should include a letter of nomination and curriculum vitae including the candidate's education, professional experience & activities, awards & honors, offices held and specifics on significant contributions. The letter of nomination should highlight these significant contributions. A representative list of references to the candidate's more important contributions, an evaluation of the significance of these achievements, and a listing of the nominee's most significant publications and patents are also appropriate. Strong seconding letters are suggested. The specific reference for every publication or patent is neither required nor encouraged. Electronic submissions are preferred.

Deadline for **receipt** of nominations is **November 19, 2008.**

Send nomination and supporting material to:

Dr. Kenneth Street
Chair, Cleveland Section Awards Committee
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2009 Central Regional Meeting of the American Chemical Society

May 20-23, 2009
Cleveland, Ohio
www.cermacs2009.org

Co-sponsored by:

The American Chemical Society
The Electrochemical Society,
The Society for Applied Spectroscopy
The American Vacuum Society
The Ernest B. Yeager Center for Electrochemical Sciences

CERMACS 2009, to be held at the Renaissance Hotel in Cleveland, is fast approaching. We need volunteers to chair important committees, such as Social Events, Registration, etc. and we need volunteers to work these committees. Over 800 attendees are expected. The program features plenary speakers Professor Charles Lieber of Harvard and Professor Daniel Nocera of Massachusetts Institute of Technology, each addressing the theme "Meeting Energy & Environmental Challenges Through Functional Materials."

Some of the many symposia planned include:

- Energy Storage and Energy Conversion
- Functional Materials
- Women in Electrochemistry
- Art and Chemistry
- Forensic Chemistry
- 100 Years of Chemistry in Cleveland
- Health Impact of Nanomaterials
- Lunar Regolith and Simulants Characterization
- Solid State Chemistry
- Computational Chemistry
- Protein NMR
- Microwave Synthesis & Sample Preparation

General symposia include the traditional areas:

Analytical, Inorganic, Organic, Physical, Polymer and Environmental

Your help is needed to make CERMACS 2009 a great success. To volunteer, please contact Professor Dan Scherson or Dr. Ken Street.

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Isotopics is looking to highlight local chemistry professionals, companies, teachers, research groups, students, events, and more. If you have an idea for an *Isotopics* article, please contact the editor. *Isotopics* is also looking for local members to join our staff. Time commitments for staff members are minimal (a few hours a year!) and your contributions will be invaluable to our local section. If you are interested in joining *Isotopics*, please contact the editor.