The Blue Ridge Chemist

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Department of Chemistry and the College of Science at Virginia Tech Host the September Meeting

VIRGINIA BLUE RIDGE SECTION

AMERICAN CHEMICAL SOCIETY

673rd SECTION MEETING

Virginia Tech

Thursday, September 24, 2015

PROGRAM:

5:30-6:00 Social Time, Hahn Hall South Atrium
6:00-7:00 Dinner, Hahn Hall South Atrium
7:00-8:00 Lecture, 281 Davidson Hall

The social time with registration will take place in Hahn Hall South Atrium (next building north of Davidson Hall on West Campus Drive). Barbecue buffet dinner (with vegetarian entree option) is catered by Steve Williams / Professional Catering of Blacksburg and is also in Hahn Hall South Atrium. The dinner is $14.00, with students and retired ACS members being half price.

The lecture will take place in 281 Davidson Hall. Dr. Christopher B. Williams, Associate Professor of Mechanical Engineering at Virginia Tech will give the lecture “Materials for Additive Manufacturing” (aka 3D Printing).

Reservations for the dinner must be made by FRIDAY, SEPTEMBER 18, SIX DAYS before the meeting, by contacting Paul Deck at 540-231-3493, or by e-mail to pdeck@vt.edu .

The Blue Ridge section is grateful for the financial support provided for this meeting by both the Department of Chemistry and the College of Science at Virginia Tech.

Dr. Christopher B. Williams

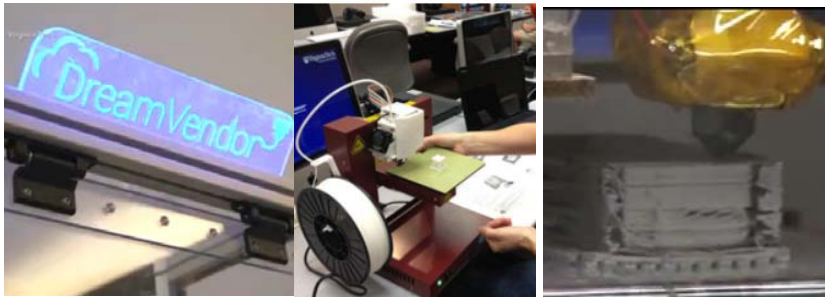
Associate Professor of Mechanical Engineering

Virginia Tech

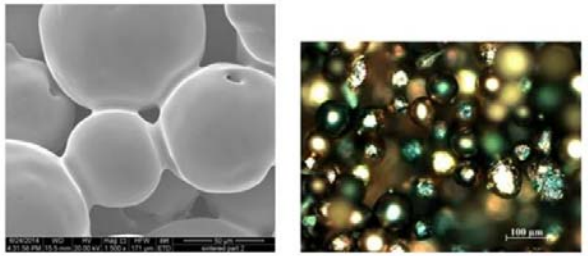
Christopher B. Williams is an Associate Professor and current W. S. Pete White Chair for Innovation in Engineering Education in the Department of Mechanical Engineering at Virginia Tech. He is the Director of the Design, Research, and Education for Additive Manufacturing Systems (DREAMS) Laboratory, and the Associate Director of the Macromolecules and Interfaces Institute. His research contributions have been recognized by six Best Paper awards at international design, manufacturing, and engineering education conferences. He is a recipient of a National Science Foundation CAREER Award (2013), the 2012 International Outstanding Young Researcher in Freeform and Additive Fabrication Award, and the 2010 Emerald Engineering Additive Manufacturing Outstanding Doctoral Research Award. Chris holds a Ph.D. and M.S. in Mechanical Engineering from the Georgia Institute of Technology (Atlanta, Georgia)

Materials for Additive Manufacturing

Additive Manufacturing (AM, commonly referred to as 3D Printing) is a class of technologies that create products via the selective placement (or forming) of material. This layerwise fabrication approach provides unsurpassed design freedom in both the geometric topology and the material composition of a product. However, to fully realize this potential, AM processes are in need of further advancements in material selection and process capability. In this talk, Chris will present an overview of AM technologies and their working materials. He will also present a perspective on the challenges of material development for AM processes and the opportunities relevant to ACS scientists in the future of AM.



For an overview of this work at Virginia Tech, see the video by Science Nation at
http://www.nsf.gov/news/special_reports/science_nation/additivemanufacturing.jsp



Waste paper could make summer grilling more environmentally friendly:

Use of Gamma-Valerolactone as an Illuminating Liquid and Lighter Fluid

ACS Sustainable Chemistry & Engineering

The development of a renewable, nontoxic lighter fluid could make summer grilling better for the planet.
Credit: AlexRaths/iStock/Thinkstock

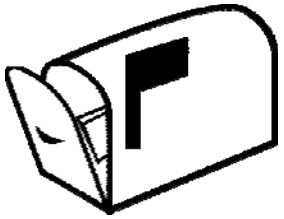
Summertime is waning, and that means the end of backyard barbecues is almost upon us. That also means an end to dousing charcoal briquettes with lighter fluid. Reducing the use of lighter fluid might not be a bad thing, as many of those products are made from crude oil and emit potentially harmful compounds when lit. Now, researchers report in *ACS Sustainable Chemistry & Engineering* that they developed a waste-paper-based, environmentally friendly and sustainable alternative.

Igniting fires has been a keystone to human civilization. Ancient communities used plant and animal fats for both illuminating the night and cooking their meals. For centuries, people have started fires with vegetable oils and lard. Other examples of long-used igniting fluids are kerosene and paraffin oil. Nowadays, people primarily use electricity for lighting and often pour on petroleum-

based lighter fluids to start charcoal grills and wood fires. In an effort to move toward a more sustainable type of fluid, as well as to mitigate the potential harmful effects of currently available products, István T. Horváth and colleagues sought an alternative.

The researchers started with waste paper and newsprint and, through a multistep process, converted the materials into a compound called gamma-valerolactone (GVL). The team demonstrated that GVL can safely start charcoal grills and can light glass lamps without forming smoke or odors. They say that because GVL is renewable and nontoxic, it could someday be a sustainable, safer alternative fluid for lighting coals at neighborhood cookouts.

The authors acknowledge funding from the City University of Hong Kong, the Innovation and Technology Fund of the Government of Hong Kong, the Hungarian Scientific Research Fund, and the Hungarian Academy of Sciences.



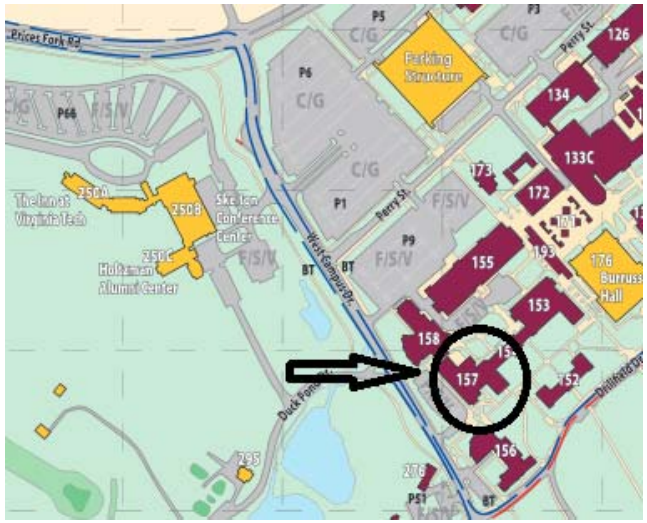
Mailing paper copies of the BRC?

In an effort to make the BRC more environmentally friendly and to save time and resources in the distribution of the BRC, the executive committee of the Blue Ridge section is considering discontinuing the mailing of the paper copy of the BRC and continuing to publish online on the section's newsletter website, http://acs-vbrs.org/newsletter.html . As presently done, a link to the pdf would continue to be emailed. Please provide any comments to the section chair, Tim Fuhrer tfuhrer@RADFORD.EDU .

Directions to Virginia Tech

From I-81 follow US-460 West to Price's Fork Road and turn right, toward Downtown Blacksburg. Follow Price's Fork Road to West Campus Drive and turn right. The first three buildings on the left, about 1/4 mile down the hill, that are facing West Campus Drive are Hahn Hall North, Hahn Hall South, and Davidson Hall. Maps of campus and a parking map may be found at www.maps.vt.edu . Guests may park without a permit after 5 PM in C/G or F/S lots as long as they are not marked "24 hours." (Note that guests need a visitor permit to use angle parking along Drillfield Drive because those spaces are "24 hour" parking.) The closest useable parking lots (see the "Parking Map" at the above link) are the Hahn Lot F/S, Davidson Lot F/S, Wright House Lot F/S, and the large C/G lot between Price's Fork Road and Perry Street. The social hour and the dinner will be in Hahn Hall South(157 on the map) and the presentation will be in 281 Davidson Hall(156 on the map). The south-facing (Drillfield-side) entrances to Davidson Hall are closed.

Map of Virginia Tech



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for VA Blue Ridge Section, American Chemical Soc.
Department of Biology and Chemistry
Liberty University
1971 University Blvd
Lynchburg, VA 24515

The October meeting will be held at Ferrum College on October 22 in anticipation of Mole Day. The details will be announced in the next issue of the Blue Ridge Chemist.