

ACS/ANACHEM/SAS APRIL MEETING

Single-Molecule Fluorescence Studies of Block Copolymer Microdomains

When: Thursday, April 7, 2016

Where: Eastern Michigan University
Halle Library Room 300
955 W. Circle Drive
Ypsilanti, MI

Time: 6:00 PM

Speaker: Dr. Takashi Ito, Kansas State University

Abstract

In recent years, single-molecule fluorescence methods including single-molecule tracking (SMT) have been employed to study molecular mass transport in self-assembled one-dimensional nanostructures. These methods offer quantitative information on the diffusion of single molecules and also on nanostructure morphologies. In this presentation, I would like to introduce our recent SMT studies of nanoscale block copolymer microdomains. We record the diffusional behavior of individual sulforhodamine B (SRB) molecules incorporated into the one-dimensional (1D) microdomains of cylinder-forming polystyrene-poly(ethylene oxide) (PS-*b*-PEO) diblock copolymer films. The resulting single-molecule trajectories permit us to determine the diffusion coefficients and diffusion directions of individual SRB molecules that reflect the permeability and orientation of the SRB-loaded PEO microdomains, in addition to the radii of the microdomains. These parameters enable a detailed comparison of microdomain morphologies in PS-*b*-PEO films prepared via two different approaches (horizontal solvent vapor penetration and substrate-defined shear flow), and also the investigation of a relationship between the radius and permeability of solvent-swollen microdomains. In addition, fluorescence recovery after photobleaching (FRAP) and SMT measurements are explored at identical areas to directly compare ensemble and single-molecule diffusion (ergodicity) with minimum influence of material heterogeneity. These fluorescence methods provide unique means to measure the morphology and permeability of polymer nanostructures under ambient conditions, and thus will afford fundamental information required to design better polymer nanostructures for chemical separations and sensing.

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**Detroit Local Section of the American Chemical Society
Participates In
Chemists Celebrate Earth Day
As Part of the Detroit Zoological Society's GreenFest
Saturday and Sunday, April 16 and 17, 2016**

The Detroit Section will run a two-day Chemists Celebrate Earth Day event at the Detroit Zoo in Royal Oak on Saturday and Sunday, April 16th and 17th. The event will run both days from 9 AM to 3 PM. The CCED event will be part of the Detroit Zoo's GreenFest program. Participants of all ages will have fun doing several hands-on experiments, including erupting volcanos, dry ice, making ink from tea, and making Slime from Guar gum.

Our volunteers include local chemists and student members from many local universities. Over 500 children are expected to participate in the activities and will receive the Celebrating Chemistry handout and a "Hooray for Chemistry" bag to take their experiments home in. BASF Corporation is sponsoring the CCED event with supplies, shirts and employee volunteers. For more information on the CCED event or to volunteer, please contact Denise Grimsley, event coordinator, at denise.grimsley@basf.com.

Tutors Needed

Tutors needed to tutor chemistry, math and biology. Tutors make 30 dollars an hour working one on one with their students. Positions are part-time. Tutors schedule their own appointments and work out of public libraries.

A college degree is required.

Interested Parties Should Contact:

Janet Rosen, Ph.D.

Learningplusonline.com

"Where Students Learn to Think"

Phone: 248-626-1980

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Biographical Sketch

Takashi Ito is a professor of chemistry at Kansas State University. He received his B.S. (1993), M.S. (1995), and Ph.D. (1998) degrees in chemistry from the University of Tokyo (Mentor: Prof. Yoshio Umezawa). He worked as a research associate at Tokyo University of Science (1998-2001; Mentor: Prof. Yuko Hasegawa) and then as a postdoctoral research associate at Texas A&M University (2001-2004; Mentor: Prof. Richard M. Crooks) before starting his independent career as an assistant professor at Kansas State University. His current research projects involve investigation of mass and charge transport within self-organized nanostructures using microscopic and electrochemical techniques for future development of efficient separation and sensing methods/materials. He currently serves as an editorial board member for The Chemical Record (The Chemical Society of Japan and Wiley).

Directions from Detroit

Take I-94 exit 183 to Huron St 0.3mi turn right at Huron St. go 1.0mi to W. Cross Ave turn left go 0.7mi and bare right on to E. Washtenaw, turn right onto Oakwood go one block past W. Circle Dr. turn right and go to lot D4 on right for paid parking. EMU map attached. Please see www.emich.edu for map.

Contact: Felix Schneider at felixschn@wowway.com or voice mail 248-583-1578.

A Call for Nominations

Every year the Detroit Local Section of the American Chemical Society honors people that have gone above and beyond the call of duty. These volunteers have taken time and energy out of their busy schedules to provide assistance and resources to the field of chemistry in various roles. We like to recognize their efforts with a Salutes to Excellence award (description below). The awardees are honored at our awards banquet.

Salutes to Excellence

Salutes to Excellence is an award program that gives ACS members an opportunity to conduct an event within their communities that recognizes the positive impact on everyday life made by a product of chemistry, a practitioner of chemistry, or a place of importance in chemistry. A central part of the event is the presentation of a commemorative plaque, furnished by Office of Community Activities, for the honorees for the chemistry achievement being honored.

If you know of an individual (or business) that deserves this recognition, please submit their name(s) to Sue White, Recognition Chair, Detroit Local Section. Her email address is saw@wayne.edu. Please submit your nominations no later than April 10, 2016.



Calendar of Upcoming Events

Second Tuesday of the Month: Detroit Section Executive Committee Meeting - from September through May (except December). Meetings start at 7:00 PM and are currently held at Lawrence Technological University. For additional information contact Professor Shannon Timmons, stimmons@ltu.edu

Third Tuesday of Every Month: Science Café - Brewing Chemistry at Traffic Jam & Snug Restaurant at 7:00 PM. For latest information, please see <http://brewingchemistry.com>

Fourth Tuesday (most months): Planning meetings for 2017 CERM at University of Detroit-Mercy. Please contact Professor Mark Benvenuto at benvenma@udmercy.edu for details.

April 7th: Joint ACS/ANACHEM/SAS Meeting titled “Single-Molecule Fluorescence Studies of Block Copolymer Microdomains” presented by Dr. Takashi Ito at Eastern Michigan University. Please see pages 1 and 3 for more details.

April 16 - 17th: CCED event at Detroit Zoo, volunteers wanted. Please see page 2 for details.

April 19th: Brewing Chemistry at Traffic Jam & Snug, 7:00 p.m., topic TBD at time of printing.

May 6th: *EVENT CHANGE* 17th Annual Rouge Water Festival at University of Michigan – Dearborn. There is a lack of space for Kids and Chemistry to participate in this popular event. While Rouge River Fest will take place this year, Kids and Chemistry will not be participating due to ongoing construction at University of Michigan Dearborn campus. For more information please contact mkheidtke@aol.com

May 17th: Brewing Chemistry at Traffic Jam & Snug, 7 p.m., topic TBD at time of printing. Please visit <http://brewingchemistry.com> for details.

May 2016: CIC Joint Meeting Annual Awards Banquet at Sinbads Restaurant and Marina in Detroit, Michigan. Speaker TBD at time of printing. For more details please see May Chemist.

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