About Your Instructors

Thomas A. P. Seery, *Ph.D. Chemistry, Associate Professor of Chemistry, Polymer Program, UCONN*

Professor Seery received his Ph.D. in Chemistry from the University of Southern California in 1991 where he researched static and dynamic light scattering of macromolecular solutions & investigated polymer-polymer & polymer-solvent interactions. While a Postdoctoral Research Fellow at the University of California, Berkeley & Lawrence Berkeley Labs he researched water based synthesis of highly conjugated polymers using organometallic catalysts & characterization of rigid back-bone polymers using light scattering and transient electric birefringence. He joined the Polymer Program at the University of Connecticut in 1994. His current research interests include synthesis of polymers on surfaces using tethered initiators, polyelectrolyte solutions & associating polymer systems, as well as, light scattering studies of light absorbing systems. Tom is Associate Editor of Polymer Engineering and Science.

Richard S. Parnas, *Ph.D. Chemical Engineering Associate Professor of Chemical Engineering UCONN*

Dr. Parnas received a B.S. degree in chemical engineering from the Massachusetts Institute of Technology in 1980. After spending two years at Exxon Research & Engineering, he got his M.S. degree from UCLA in 1984. After spending a year at SRI International in 1984-85, Dr. Parnas returned to UCLA to obtain his Ph.D. in chemical engineering in 1990. Dr. Parnas spent the next 10 years in the Polymers Division at the National Institute of Standards & Technology, the last five as head of the composites group. While at NIST, Dr. Parnas wrote Liquid Composite Molding, a widely used book on composite processing. He spent the 1999-2000 academic year on a Fulbright Scholarship at Katholieke Universiteit in Leuven Belgium before joining the Polymer Program at UCONN in 2000. Dr. Parnas currently works with biodegradable plastics, membranes, nanocomposites, and biofuels.

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Return Services Requested

Polymer Nanocomposites

A Short Course for Scientists and Engineers

Wednesday, June 9 and
Thursday, June 10, 2010
9:00 a.m. - 5:00 p.m.

Sponsored by:

Institute of Materials Science &
IMS Associates Program
University of Connecticut
Storrs, Connecticut

In the 1980's, Toyota demonstrated substantial improvements to the properties of nylon 6 from the simple incorporation of small volume fractions of clay. The prospect of improving polymer properties by adding dirt and displacing expensive synthetic chemicals is very appealing from an industrial perspective. The resulting hype and excitement led to substantial research on the preparation and properties of polymer nanocomposites.

Typical applications of composites usually are confronted by tradeoffs: increases in modulus produce brittle parts. Nanocomposites show improvements in mechanical properties with less of a decrease in other critical properties. The promise nanocomposites hold for improved barrier properties may be key to their largest application area. Reductions in gas diffusion are proposed to result from the tortuous path gas molecules must travel through the layers of inorganic filler. This property, when combined with enhancements in mechanical properties, leads to applications in food packaging. Carbonated beverages require low permeability containers to maintain fizz and clay filled polymer nanocomposites may be the answer with superior properties while using less material. There are "green" aspects to this approach too as current technology requires multi-ply construction to provide strength at low permeability. A single ply construction would be easier to recycle.

Oxygen barriers are also applicable to food packaging for extended shelf life. The ability to produce thin films of polymer nanocomposites shows promise for extended shelf life. In addition, the gas diffusion barrier is implicated in the limited flammability exhibited by polymer nanocomposites.

This course will provide background on critical issues in synthesis, fabrication, processing, and characterization of nanocomposites to guide the practitioner in assessing the utility of nanocomposite applications. We will discuss the underlying scientific principles that guide the study of structure-property relationships and will touch on parallel fields of investigation with high relevance to polymer nanocomposites. The course will also cover the incorporation of a variety of nanophases into polymeric matrixes to provide functional materials, the importance of controlling surface energy, methods for achieving dispersion and common techniques for characterizing nanocomposite materials.

Who should attend

This course will be useful to engineers and scientists who are assessing the applicability of polymer nanocomposites for future products. It may also be helpful for those currently involved with nanocomposite applications.

Course Location and Schedule

The course will be on June 9 & 10 2010 from 9am to 5pm each day. It will be held in Room 159 of the Gant Building (Institute of Materials Science) on the Storrs campus of the University of Connecticut. Parking is available across the street in North Parking Garage.

Registration

The registration fee includes workshop attendance, a set of course notes, lunch and coffee breaks. Registration for this course closes May 19, 2010.

Discounts Available

Discounts are available for employees of small companies (30 or fewer employees) and employees of IMS Associate Program member companies*. Larger companies receive a discount when sending two or more participants to this course. An early bird discount of $75 is available to anyone registering before April 9th.

Refund and Cancellation Policy

The registration fee is refundable, less $35, prior to the first day of the course, only if you notify Student Services: 877-892-6264 or 860-486-4905. Participants who do not attend and fail to cancel are subject to the full fee. Participant substitutions may be made.

The Institute of Materials Science reserves the right to change instructors and cancel or reschedule the course in the event of insufficient enrollment or unforeseen circumstances.

Further Information

Questions regarding the course should be directed to Mark Dudley at 860-486-2256 (voice), 860-486-4745 (fax) or mark.dudley@uconn.edu.

* IMS Associates Program

The IMS Associates Program assists industry with short term projects in research, development and manufacturing projects where expertise or facilities are not readily available from the private sector. For more information see IMS Outreach: http://www.ims.uconn.edu/.

Schedule # XPW-77-1002

Polymer Nanocomposites

Registration Form

June 9-10, 2010

Name ________________________________

Title ________________________________

Company ________________________________

Business Address ________________________________

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Phone ________________________________

Fax ________________________________

E-mail ________________________________

Please let us know in advance if you require special services or arrangements.

Registration Fee

IMS Associate Program members*

- ☐ $300 each for the first <u>two</u> registrants
- ☐ $550 additional registrants

Non-Associate Program member

Small Companies (≤30 employees)

- ☐ $550 per registrant

Large Companies (>30 employees)

- ☐ $700 first registrant
- ☐ $550 additional registrants

*** Early bird discount of $75/ off any registration processed before April 9th!

Method of Payment

Online — To pay by credit card (VISA/MasterCard/Discover/Diners Int'l) http://www.ims.uconn.edu/index.html, select the event then click on registration.

Mail — __ Check enclosed payable to UConn

__ Purchase Order # ____________________

Send complete registration form and check or PO to: University of Connecticut, Student Services Office, One Bishop Circle, Unit 4056, Storrs, CT 06269-4056.

Secure FAX: 860-486-0272 Don't forget to complete your credit card authorization

In person: Visit Student Services Office, Room 114, **Bishop Center**, Storrs campus from 8:30am to 4:30pm. (http://admissions.uconn.edu/virtualtour/search/)