You are cordially invited to attend

The 35th Annual

Harry G. Fair Memorial Lecture in Chemical Engineering

Thursday, March 27, 2008
Seminar – 2:30 P.M.
M-204 Sarkeys Energy Center
100 East Boyd
University of Oklahoma
Norman, Oklahoma

Coffee and refreshments will be served prior to the lecture.

Accommodations on the basis of disabilities are available by calling (405) 325-5811.

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Harry G. Fair Memorial Lecturers

2008  Donald R. Paul, University of Texas at Austin
2007  David Mooney, Harvard University
2007  John Prausnitz, University of California, Berkeley
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2005  James A. Dumesic, University of Wisconsin
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2003  Nicholas Peppas, University of Texas at Austin
2002  Richard C. Alkire, University of Illinois
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1999  George Stephanopoulos, Massachusetts Institute of Technology
1998  Stuart L. Cooper, University of Delaware
1997  Keith E. Gubbins, Cornell University
1996  H. Scott Fogler, University of Michigan
1995  Gary L. Haller, Yale University
1994  Christopher W. Macosko, University of Minnesota
1993  Larry V. McIntire, Rice University
1992  Dan Luss, University of Houston
1991  E.N. Lightfoot, University of Wisconsin
1990  George A. Samara, Sandia National Labs
1989  James Wei, Massachusetts Institute of Technology
1988  C. Judson King, University of California, Berkeley
1987  Eli Ruckenstein, SUNY Buffalo
1986  Stuart W. Churchill, University of Pennsylvania
1982  Lynn T. Reed, Warren Petroleum Co.
1981  Robert S. Purgason, Perry Gas Processors
1980  A.B. Slaybaugh, Conoco Inc.
1979  Charles R. Perry, Perry Gas Co.
1978  Raymond W. Lowe, E.I. DuPont de Nemours
1977  Laurence S. Reid, Ball-Reid Engineers Inc.
1976  Harry L. Blomquist Jr., Coastal States Gas Co.
1975  Stanley Learned, Phillips Petroleum Co.

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Polyolefin Nanocomposites: Structure and Properties
Polyolefin Nanocomposites: Structure and Properties

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Polymer-layered silicate nanocomposites formed from the organically modified clay mineral montmorillonite and related materials have attracted a great deal of technological and scientific interest in the past decade. These composites offer the promise of greatly improved properties over those of the matrix polymer owing to the nanoscale reinforcement and other effects caused by dispersing the one nanometer thick, high aspect ratio aluminosilicate layers. However, the key to achieving these benefits is dispersing the organoclay into the polymer matrix to generate high aspect ratio particles. This presentation will give a status report on what is known about generating nanocomposites based on various polymer matrices. Many factors are involved in achieving a high level of dispersion, or ultimately full exfoliation, but one of the most important is the complex interaction of the polymer matrix with the organoclay.

Donald R. Paul biography

Donald R. Paul is the Ernest Cockrell, Sr. Chair in Engineering in the Department of Chemical Engineering at the University of Texas at Austin and Director of the Texas Materials Institute.

Dr. Paul’s research interests include the broad areas of polymer science and engineering and chemical engineering. Current research involves various aspects of polymeric materials including polymer blends; membranes for separations, drug delivery, packaging, etc.; and polymer processing. The blend research deals with the thermodynamics of polymer-polymer interactions (miscibility, phase diagrams, interfaces), reactive compatibilization of multiphase mixtures, rubber toughening, the control of phase morphology during processing by both chemical and physical means, and polymeric nanocomposites. The research on diffusion in polymers involves investigation of structure-property relationships to design better membranes for separation processes and improved barrier materials plus an interest in theories and models for describing sorption and permeation of small molecule penetrants in polymers including the rubbery, glassy, semicrystalline, and liquid crystalline states of these materials. The research on nanocomposites involves devising chemical and processing strategies for exfoliating layered silicates in polymer matrices for improvement of performance using nanoscale reinforcement. Synthesis, characterization, and performance of polymers are an integral part of the research in these areas.

Dr. Paul’s education is from the University of Wisconsin and North Carolina State University. He is a member of the National Research Council, a member of the National Academy of Engineering, a Fellow of AIChE, and a Fellow of the Society of Plastics Engineers. He is co-author of three books and has published over 500 research papers. He has been editor of Industrial & Engineering Chemistry Research for over 20 years. Other honors include the William H. Walker Award from AIChE and the E.V. Murphree and Herman F. Mark Polymer Chemistry Awards from the American Chemical Society.