SPE® ANNOUNCES WINNERS OF 5TH-ANNUAL ACCE GRADUATE SCHOLARSHIPS ON AUTOMOTIVE COMPOSITES

Virginia Tech Ph.D. Candidate to Receive Funds for Research on Nanocomposites

David Inglefield, a Ph.D. candidate pursuing a dual degree in Chemistry and Biomedical Engineering at ***Virginia Polytechnic Institute & State University*** (Virginia Tech, Blacksburg, Va.), is the 2011-2012 winner of an ***SPE Automotive Composites Conference & Exhibition (ACCE)*** graduate-level scholarship for transportation composites research. Inglefield, who is from Fairfax, Va. and expects to graduate in 2014, won this year's scholarship for a research project involving the synthesis of functionalized carbon nanotubes for optimized properties in polymer composites, a project that could have broad application in automotive composites.

As Inglefield explains, since their discovery in 1991, interest in carbon nanotubes (CNTs) has grown rapidly and their use has expanded into areas as diverse as electronics and bionanotechnology. One of their most promising areas of usage is to improve the properties of polymer composites by increasing mechanical strength (without raising resin weight or density as most reinforcements do) and conferring electrical and thermal conductivity to materials that normally provide neither property. However, wider usage has been limited by many factors, including high production costs and challenges effectively dispersing the nanoparticles into polymer matrices. Developing a functionalized CNT that effectively interacts with the resin in which it is incorporated remains a significant challenge in expanding usage of this technology.

David Inglefield holds a B.S. degree in Biochemistry from Virginia Tech, which he received in 2009. Since graduating, he has worked as a graduate research assistant under his undergraduate and graduate research advisor, Dr. Timothy E. Long, professor of Chemistry and associate dean of Strategic Initiatives, Department of Chemistry, College of Science at Virginia Tech. The focus of their graduate work together has been synthesis and characterization of novel functionalized multiwall carbon nanotubes (MWCNT) and MWCNT composites. Inglefield's undergraduate work with Long involved synthesis and characterization of cinnamate functionalized ultraviolet (UV) cross-linkable ammonium ionenes. Since receiving his undergraduate degree, Inglefield also has worked as teaching assistant (undergraduate Organic Chemistry lab for non-majors) at Virginia Tech and has been an American Chemistry Society (ACS) short-course presenter, where he was responsible for demonstrating various polymerization techniques. His current research expertise is in organic functionalization of MWCNT for polymer composites; electrospinning of polymers and MWCNT composites; performing transmission-electron and scanning-electron microscopy, nuclear magnetic-resonance spectroscopy, differential scanning calorimetry, thermogravimetric analysis, Raman and infrared spectroscopy, cryomicrotomy, dynamic light-scattering analysis, and rheology. In addition he has co-authored two publications presented at industry conferences.

University of Wisconsin-Madison Doctoral Candidate to Receive Funds for Research on Short-Fiber Thermoplastic Composites

Thomas (Tom) G. Loken, a doctoral candidate in Mechanical Engineering at ***University of Wisconsin-Madison*** (Madison, Wisc.) as well as a project engineer at The Madison Group (Madison, Wisc.), is the second 2011-2012 winner of an ***SPE Automotive Composites Conference & Exhibition (ACCE)*** graduate-level scholarship in transportation composites research. Loken, who is from Winona, Minn. and expects to graduate in 2014, won this year's second scholarship for a research project analyzing the effects of processing conditions on fiber-length distribution in short-fiber composites.

Short-fiber thermoplastic composite materials are widely used in the automotive industry. These materials offer enhanced mechanical properties over unfilled resins, yet remain viable for high-volume production methods, such as injection molding, making metals replacement cost-effective thanks to parts consolidation, weight reduction, and elimination of secondary-finishing operations. However, the mechanical properties of fiber-filled composites are strongly influenced by orientation and length/diameter (L/D) ratios of reinforcing fibers, making final part properties highly dependent upon processing conditions. In the case of injection molding, fiber damage and attrition can occur during processing, reducing final L/D ratio. Therefore it is useful to understand which process parameters have the greatest effect on final fiber-length distribution.

Thomas Loken holds a B.S. degree in Composite Materials Engineering from Winona State University (Winona, Minn.), which he received in 2009. During his undergraduate studies he worked as a testing intern at the school's Composite Materials Technology Center (COMTEC), where he conducted mechanical and analytical testing on composites and plastics. He also worked as a process engineering intern at RTP Co. (Winona, Minn.) in the extrusion/compounding of thermoplastics and short-fiber composites. At RTP, Loken was responsible for SPC charting, corrective actions, and process studies. After graduating, he served as the manufacturing engineer at Rolco Inc. (Kasota, Minn.) where he managed work instructions, corrective action requests, and process optimization, and project-managed four family tools used to produce automotive parts with glass-filled polyamide – from mold inspection, to sampling, to production. Loken also conducted considerable research – using factorial screening experiments, response surface experiments, and validation – on secondary spin-welding operations for these parts to ensure a hermetic seal was achieved. He is currently a project engineer at The Madison Group where he conducts failure analysis of plastics and provides consulting services to the plastics community. Loken is concurrently a full-time graduate student in the Mechanical Engineering department at the University of Wisconsin-Madison working with Drs. Tim Osswald and Paul Gramann.