



The Electrical & Computer Engineering and Electro Optics Seminar
Wednesday, September 11 at 10:00 a.m. – 11:30 a.m.
Science Center Auditorium (SC 114)

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Abstract

Despite much effort to control dispersion, alignment and overall processing of Carbon Nanotubes, their surface analysis remains an active topic of research. As-grown CNTs are often chemically-treated to eliminate spurious chemicals and residual carbonaceous species that decorate outer walls. Chemical treatments (of both covalent and non-covalent nature) yield local defects along the graphitic structure. These defects are effective latching sites, conducive to polymeric interaction; a prelude to dispersion. Albeit, as-grown CNTs can successfully dissolve in polymeric solutions, as a result of collective non-covalent molecular interactions. The non-specific nature of interactions between untreated CNTs and polymers suggests viability of minimal processing approaches; holding some promise towards cost-effective manufacturing.

With all, the possibility of controlled surface chemistry, paves the way of CNTs towards supramolecular chemistry, with π - π and CH- π interactions playing an important role in bonding dynamics. In this work, we examine polymer-MWCNT composites by Near Edge X-Ray Absorption Fine Structure (NEXAFS). Several synthesis scenarios are examined; where CNTs are either untreated or non-covalently modified. NEXAFS presents singular property capabilities; analyzing alignment of both matrix and nanofillers, and probing into the matrix-filler interface. This exploration provides insights on conformational structure and bonding type, offering invaluable information towards the synthesis-structure-property paradigm.

Biography

Dr. Eva Campo is a faculty member at the School of Electronic Engineering at Bangor University (UK) and Adjunct Associate Professor at the University of Texas in San Antonio. Dr. Campo completed her PhD in Materials Science and Engineering at Lehigh University, Bethlehem (PA). She did research as a post-doctoral scientist at the Center for Optical Technologies in collaboration with the Army Research Labs (ARL). She is a Senior Member at SPIE. Dr. Campo organized the Education Symposium at MRS: Towards a Lab to Classroom Initiative (Spring 2013) and the "Materials by Design-Merging Advanced In-Situ Characterization with Predictive Simulation" (Spring 2014).