

Materials Seminar

“Chemical Strategies in Nanoscience”

In the first part of the talk, I discuss selected chemical strategies used for the focused functionalization of single walled carbon nanotube (SWNT) surfaces. In recent years, SWNTs have been treated as legitimate nanoscale chemical reagents. Hence, herein we seek to understand, from a structural and mechanistic perspective, the breadth and types of controlled covalent reactions SWNTs can undergo in solution phase, not only at ends and defect sites but also along sidewalls. Controllable chemical functionalization suggests that the unique optical, electronic and mechanical properties of SWNTs can be much more readily tuned than ever before, with key implications for the generation of nanoscale working devices such as solar cells.

In the second part of the talk, environmentally friendly synthetic methodologies have gradually been implemented as viable techniques in the synthesis of a range of nanostructures. In this work, we focus on the applications of green chemistry principles with respect to the synthesis of metal-containing nanostructures. In particular, we describe advances in the use of template-directed techniques as sustainable and cost-effective methodologies that allow us to generate functional nanomaterials without the need to sacrifice on sample quality, purity, and crystallinity, in addition to control over size and shape. We have subsequently created a number of different potential architecture systems for gaining valuable insights into fuel cell performance.

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Monday, October 7 at 3:30 pm in 1315 Chemistry