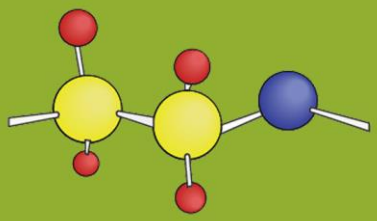

POLYMER PROGRAM SEMINARS

POLYMER PROGRAM SEMINAR

Friday, April 26, 2019
11:10 AM, IMS 20

Satish Kumar,
Georgia Institute of Technology

"Carbon and Multifunctional Fibers, and nanocomposites"

Specific strength of today's carbon fibers is an order of magnitude higher than that of steel. However, there are number of issues that limit carbon fiber applications. These include performance, cost, and factors related to sustainability. There is also the opportunity to add functionalities (e.g., thermal and electrical conductivity, superparamagnetic properties, anisotropic electromagnetic absorption, etc) to various fibers, including carbon fibers, textile fibers, as well as specialty fibers. Today's state-of-the-art commercial carbon fibers used for structural applications are based on PAN copolymers, and have a tensile modulus of 275 GPa and tensile strength of 5.5 GPa. Using the gel spinning technology, under the DARPA-funded program, PAN-based carbon fibers have been processed on a continuous carbonization line at Georgia Tech with a tensile strength of 5.5 GPa and tensile modulus of 375 GPa. At short gage length, fiber tensile strength as high as 12 GPa has been measured. Continuous carbon fibers are also being processed from PAN/carbon nanotubes, and these fibers exhibit Joule heating effect, as well as enhanced electrical and thermal conductivity as compared to the PAN-based carbon fibers. While fiber tensile strength has increased by an order of magnitude over the last century, we expect that significantly improved fibers will be developed over the coming decades. There are significant research opportunities in Chemistry, Materials Science, and Nano Engineering that will make these revolutionary fibers possible.

For more information, please contact Osker Dahabsu at osker@uconn.edu or visit *polymer.ims.uconn.edu*