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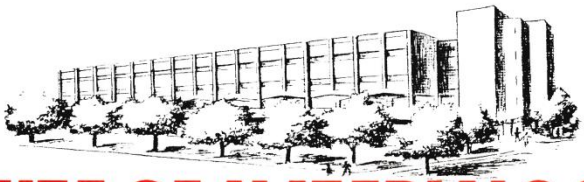

INSTITUTE OF MATERIALS SCIENCE

POLYMER PROGRAM SEMINAR

"Polymer Nanofibers: Electrospinning, Structure, and Properties"

Dr. Masaya Kotaki
Kaneka Americas Holding, Inc.

Friday, November 14, 2014
11:00 AM, IMS Room 20

Electrospinning has been widely employed as a technique to produce sub-micron and nanometer scale polymer fibers. The technique utilizes electrical forces induced by a high voltage to draw charged polymer solution jet into fine solid fibers. To obtain fine fibers, one of the approaches is to utilize a rotating instrument to collect the fibers. The high rotational speed of the collector exerts an additional mechanical drawing force on the fibers, subjecting the fibers to extensive stretching. Structural characteristics such as crystallinity and molecular orientation, developed during the stretching process can enhance mechanical properties of the material system.

In this presentation, structural development and mechanical properties of electrospun polymer nanofibers collected with a rotating disc at different take-up velocities were investigated. Tensile properties of "single" polymer nanofibers were characterized using a nano-tensile tester. Effects of molecular weight and solvent chracteristics on structure and tensile properties were discussed with poly(lactide-acid) (PLLA) nanofibers. Effect of crystallization rate was discussed in comparison of PLLA and poly[(R)-3-hydroxybutyrate-co-(R)-3-hydroxyvalerate] (PHBV) nanofibers. Polycaprolactone (PCL) containing polyhedral oligomeric silsesquioxane (POSS-PCL) composite nanofibers were also characterized in order to discuss effect of nanometer scale filler on structural development of polymers in electrospinning process.

**For further information, please contact YH Chudy at ychudy@ims.uconn.edu*

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