Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Nanofibers from Melt Blown Fiber-in-Fiber Polymer Blends[1] ZAIFEI WANG, FENG ZUO, DAWUD TAN, Department of Chemical Engineering and Materials Science, University of Minnesota Twin Cities, SOONDEUK JEUNG, Cummins Filtration, CHRISTOPHER MACOSKO, FRANK BATES, Department of Chemical Engineering and Materials Science, University of Minnesota Twin Cities, DEPARTMENT OF CHEMICAL ENGINEERING AND MATERIALS SCIENCE, UNIVERSITY OF MINNESOTA TWIN CITIES TEAM, CUMMINS FILTRATION COLLABORATION — Nanofibers were generated by melt blowing three sets of polymer blends each comprised of pairs of immiscible components. Blends containing minority phases of poly(ethylene-*co*-chlorotrifluoroethylene) (PECTFE) in poly(butylene terephthalate) (PBT), PECTFE in poly(styrene) (PS), and PBT in PS, were melt blown into long (>100 microns) fibers with average diameters of several microns. Electron microscope revealed that melt blowing transformed the initial spherical dispersions into a nanofibers-in-fiber morphology. Macroscopic mats of nonwoven PBT and PECTFE nanofibers, with average diameters as small as 70 nm, were isolated by selectively removing the majority phase with a solvent. This method provides a potentially inexpensive, high throughput, one step route to scalable quantities of polymeric nanofibers.

[1]Cummins Filtration

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Date submitted: 07 Nov 2013 Electronic form version 1.4