

Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Controlling solidification and fiber diameter of Polyethylene oxide nanofibers electrospun from aqueous solution by controlling the partial pressure of water vapor SUREEPORN TRIPATANASUWAN, ZHENXIN ZHONG, DARRELL RENEKER, U. of Akron — Electrospinning is widely in research attention due to its cost effectiveness and straightforwardness for making nanofibers. During the electrospinning process, a charged jet is elongated by repulsive force between electrical charges carried by the jet. The charged jet develops spiral path due to the electrically driven bending instability, which make it possible for the jet to elongate and produce nanofibers in a small space. Solidification has been identified as an important factor that determines the diameter of electrospun nanofibers. The elongation and thinning of a charged jet stops as the charged jet is solidified. Controlling solidification of the charged jet by controlling of partial vapor of water in electrospinning of polyethylene oxide from aqueous solution has been demonstrated in this study. As the partial vapor of water increase, the solidification process of the charged jet becomes slower, allowing elongation of charged jet to continue.

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Date submitted: 02 Dec 2006

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