

Abstract Submitted
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Morphology development in electrospun nanofibers¹ THEIN KYU, PRATYUSH DAYAL, The University of Akron — The present article presents the modeling and simulation of the kinetics of electro- spinning process in conjunction with the spatio-temporal evolution of fiber morphology driven by phase separation. The spinning process has been modeled based on an array of beads connected by Maxwell's elements in cylindrical coordinates to describe the viscous retracting force counter-balanced by the Columbic forces representing the repulsive electrostatic charges. The dynamics of phase separation in the unstable region of a polymer solution has been calculated based on the Cahn-Hilliard time evolution equation. The simulation based on the coupling of these two processes has revealed the formation of porous voids, concentration bands perpendicular to the spinline (similar to banded textures) and along the spinline leading to splitting of the electro-spun fiber into nanofibrillar strands.

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