

Abstract Submitted
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Simulation of heat transport in polymer nanocomposites NING SUN, MIRIAM RAFAILOVICH, DILIP GERSAPPE, Department of Materials Science and Engineering, Stony Brook University, NY, 11794 — The design of fire-safe materials by using flame retardants within polymers requires a fundamental understanding of the physics and dynamics of the heat transport process with in the multiphase systems. We have developed a Lattice-Boltzmann model to simulate the 3-D heat transfer in a two-component system comprised of a polymer matrix and flame retardant nanocomposite fillers. By varying the volume fraction of the fillers, we compared the heat propagation phenomena before and after the percolation of the nano-fillers in the system. We also vary the size, shape, thermal conductivity and heat capacity of the nanofiller to study their effects on the heat dissipation and the time to ignition.

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