

Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Non-Coalescent, Self-Assembling Water Drops: Phase transitions, flows and hydrodynamics MOHAN SRINIVASARAO, School of Polymer, Textile and Fiber Engineering, School of Chemistry and Biochemistry, VIVEK SHARMA, School of Polymer, Textile and Fiber Engineering, Georgia Institute of Technology, Atlanta GA 30332 — We study the collective nucleation, growth and self-assembly of non-coalescent water drops. These form and organize over evaporating polymer solutions exposed to a draft of moist air. The creation and evolution of a population of drops towards a closed packed array occurs in response to heat and mass fluxes involved in droplet condensation and solvent evaporation. We elucidate the kinetics and dynamics of droplet growth and assembly, by accounting for various transport and thermodynamic processes. These water drops template hexagonally ordered arrays of holes in polymer films. We thus have a useful and economical method for manufacturing porous films requiring only a drop of polymer solution (dilute) and a whiff of breath!

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Date submitted: 01 Dec 2007

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