Abstract Submitted
for the DFD12 Meeting of
The American Physical Society

Fog-harvesting Mesh Surfaces KYOO-CHUL PARK, Department of Mechanical Engineering, Massachusetts Institute of Technology, SHREERANG S. CHHATRE, SIDDARTH SRINIVASAN, ROBERT E. COHEN, Department of Chemical Engineering, Massachusetts Institute of Technology, GARETH H. MCKINLEY, Department of Mechanical Engineering, Massachusetts Institute of Technology — Fog represents a large, untapped source of potable water, especially in arid climates. Various plants and animals use morphological as well as chemical features on their surfaces to harvest this precious resource. In this work, we investigate the influence of surface wettability, structural length scale, and relative openness of the weave on the fog harvesting ability of mesh surfaces. We choose simple woven meshes as a canonical family of model permeable surfaces due to the ability to systematically vary periodicity, porosity, mechanical robustness and ease of fabrication. We measure the fog collecting capacity of a set of meshes with a directed aqueous aerosol stream to simulate a natural foggy environment. Further, we strive to develop and test appropriate scalings and correlations that quantify the collection of water on the mesh surfaces. These design rules can be deployed as an a priori design chart for designing optimal performance meshes for given environmental/operating conditions.

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Date submitted: 09 Aug 2012 Electronic form version 1.4