Abstract Submitted
for the DFD14 Meeting of
The American Physical Society

Sessile drops and condensation on chemically patterned micropillars OREST SHARDT, PRASHANT WAGHMARE, Department of Mechanical Engineering, University of Alberta, DANIEL OREJON, International Institute for Carbon-Neutral Energy Research (WPI-I2CNER), Kyushu University, NAGA GUNDA, Department of Mechanical Engineering, University of Alberta, YASUYUKI TAKATA, International Institute for Carbon-Neutral Energy Research (WPI-I2CNER), Kyushu University, SUSHANTA MITRA, Department of Mechanical Engineering, University of Alberta — We examine the state of sessile drops on silicon micropillars with patterned wettability as well as condensation of water onto such surfaces. These patterned micropillar arrays were created by treatment with a perfluoroalkylsilane to create a hydrophobic surface and subsequent patterning with sodium hydroxide solution to create hydrophilic regions. The surfaces were characterized by measuring the contact angles and observing the states of sessile drops, and the results are compared with those of uniformly hydrophobic and hydrophilic pillars. The nature of condensation onto patterned pillars has been examined with environmental scanning electron microscopy (ESEM). The results show the initial dropwise condensation on the different types of pillars and the transition to a film. Surfaces that combine texturing with chemical patterning could be useful for enhanced control of condensation and droplet motion.

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Date submitted: 31 Jul 2014 Electronic form version 1.4