Abstract Submitted
for the DFD14 Meeting of
The American Physical Society

Dynamics of hemiwicking JUNGCHUL KIM, ILDOO KIM, HO-YOUNG KIM, Seoul Natl Univ — We study the wicking dynamics of a liquid on a surface decorated with micropillars, which has been long known to be governed by the Washburn-like dynamics. However, rough substrates cannot be described by a single geometric parameter like a tube with a constant radius. So far, different forms of scaling laws for liquid propagation distance were suggested by different researchers, but most of the laws are valid for the specific experimental conditions (e.g. pillar aspect ratio) employed in each work. Here we propose a novel scaling law for the wetting speed as a function of the width, gap, and height of the pillars, and the physicochemical liquid properties, which is valid for considerably wide parameter space. Also, we discuss the maximum pillar spacing up to which the current assumption of densely spaced pillars is valid.

Jungchul Kim
Seoul Natl Univ

Date submitted: 01 Aug 2014 Electronic form version 1.4