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Length scale effects in wetting of chemically heterogeneous surfaces NEEHARIKA ANANTHARAJU, MAHESH PANCHAGNULA, Tennessee Technological University, SRIKANTH VEDANTAM, National University of Singapore — Wetting of chemically heterogeneous surfaces is modeled using phase field theory. Contact angle hysteresis is incorporated by a modified kinetic parameter. Using this model, we study the effect of varying the heterogeneity length scale on the resulting sessile drop behavior during advancing and receding events. A chemically heterogeneous surface is said to be composed of a predetermined arrangement of two materials. The novelty in the current approach lies in the fact that a surface made from any of the two "pure" materials, itself exhibits contact angle hysteresis. Using this model, we demonstrate the effect of variation in the length scale of a chemically heterogeneous surface as deviation from Cassie theory for a surface with a finite length scale exceeding the diffuse interface thickness. In addition, we demonstrate that the shape of the advancing and receding contact line is sensitive to the specific arrangement of the two materials, leaving open the possibility to manipulate the drop using contact line kinetics.

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