Abstract

A comprehensive understanding of the wetting dynamics of rough hydrophobic surfaces is necessary for the optimization of practical applications. Molecular dynamics simulations have been used to study the impact and sliding of a nano-sized water droplet on nanostructured pillared surfaces. The dynamic behavior of the water droplet, which could be classified into three different groups, depended on the static state of the water droplet, the pillar characteristics (e.g., height and the lateral and gap dimensions of the pillars), and the magnitude of the applied body force. We obtained the advancing and receding contact angles and the corresponding contact angle hysteresis of the water droplets, which helped classify the water droplets into the three different groups.