Dynamic Effects of Bouncing Water Droplets on Superhydrophobic Tungsten Oxide nanowire surfaces

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The effects of surface energy on the wetting transition for impinging water droplets were experimentally investigated on the chemically modified WOx nanowire surfaces. We could modify the surface energy of the nanostructures through chemisorption of alkyltrichlorosilanes with various carbon chain lengths and by the UV-enhanced decomposition of self assembled monolayer (SAM) molecules chemically adsorbed on the array. Three surface wetting states could be identified through the balance between ant repellent surface to impinging droplets.

**Keywords:** superhydrophobicity, WOx nanowire, surface modification, impact dynamics

Photoluminescence property of vertically aligned ZnO nanorods.

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Vertically aligned zinc oxide (ZnO) nanorods (NRs) with different surface morphology were grown by metalorganic chemical vapor deposition (MOCVD) on sapphire substrate with different deposition condition. Based on the surface morphology, ZnO nanostructures are divided into three types: nanoneedles, nanonails and nanorods with rounded tip. Variable temperature photoluminescence (PL) have employed to probe the exciton recombination in high density and vertically aligned ZnO Nanorod arrays. Low-temperature photoluminescence measurements do not show any significant yellow emission, but the near band edge excitonic emission shows very strong dependence with the surface morphology. The recombination properties are expected to be different due to different surface-to-volume ratio and distribution of potential fluctuations of intrinsic defects.

**Keywords:** ZnO, Photoluminescence