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Dynamic Effects of Bouncing Water Droplets onSuperhydrophobic Tungsten Oxide nanowire surfaces

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The effects of surface energyon the wetting transition for impinging water droplets were experimentallyinvestigated on the chemically modified WOx nanowire surfaces. We could modifythe surface energy of the nanostructures through chemisorption ofalkyltrichlorosilanes with various carbon chain lengths and by the UV-enhanceddecomposition of self assembled monolayer (SAM) molecules chemically adsorbedon the array. Three surface wetting states could be identified through thebalance between antiwetting and wetting pressures. This approach establishessimple strategy for the design criteria for water-repellent surface toimpinging droplets.

Keywords: superhydrophobicity, WOxnanowire, surface modification, impact dynamics

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Photoluminescence property of vertically aligned ZnOnanorods.

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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 differentdeposition condition. Based on the surface morphology, ZnO nanostructures aredivided into three types: nanoneedles, nanonails and nanorods with rounded tip.Variable temperature photoluminescence (PL) have employed to probe the excitonrecombination in high density and vertically aligned ZnO Nanorod arrays. Lowtemperature photoluminescence measurements do not show any significant yellowemission, but the near band edge excitonic emission shows very strongdependence with the surface morphology. The recombination properties areexpected to be different due to different surface-to-volume ratio anddistribution of potential fluctuations of intrinsic defects.

Keywords: ZnO, Photoluminescence