Sonochemical growth of vertically aligned ZnO nanorod arrays over large areas

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By the use of chemical effects of ultrasound, sonochemistry has been the topic of intensive investigation as a promising route for the synthesis of nanostructured materials that have attracted great attention for nanoelectronics due to their important properties based on nanometer-scale dimension. Although nanoelectronic devices can be fabricated by attaching as-prepared nanostructured materials on the substrate, direct synthesis of nanostructured materials on the substrate is more effective route for the fabrication of high-performance devices. However, no one reported such direct synthesis of nanostructured materials on the substrate by a sonochemical method. Here, we report a simple sonochemical route for the synthesis of zinc oxide (ZnO) nanorod arrays on various substrates over large areas, and moreover, we show the patterned growth of ZnO nanorod arrays. The diameter and length are ~150 nm and ~900 nm, respectively. The length of ZnO nanorod arrays can be controlled by adjustment of ultrasonication time.