

High Quality Gallium Oxide Microstructures by Catalyst-Free Thermal Oxidation

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Abstract : In this study, high crystalline gallium oxide microstructures (wires, belts, and sheets) were synthesized by catalyst-free thermal oxidation. Structural studies such as X-ray diffraction, Raman and transmission electron microscope (TEM) investigations on the microstructures showed monoclinic phase of gallium oxide and single crystalline structure. The scanning electron microscopy (SEM) observations revealed that a huge super microsheet even grows up to 450 μm in length and 206 μm in width. Gallium oxide microstructures exhibit high crystallinity along (002) and (401), respectively. The PL spectrum of these microstructures excites a blue light band centered at 441 and 489nm. The growth mechanism of gallium oxide microstructures is discussed. These gallium oxide microstructures have great potential in functional devices.

Keywords : catalyst-free, gallium oxide, microstructures, thermal oxide

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