



Growth of tetragonal SnO₂ microcubes and their characterization

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Abstract

Single-crystalline SnO₂ microcubes were grown using the hydrothermal method without any catalyst. X-ray diffraction (XRD) patterns and energy dispersive X-ray (EDX) analysis verified that the cubes are tin dioxide SnO₂. Their morphology and structure was studied by scanning electron microscopy (SEM), transmission electron microscopy (TEM), selected area electron diffraction (SAED), and Raman spectroscopy. It is revealed that the cube-shaped SnO₂ crystal have dimension varying from 500 nm to 5 μm as a function of chemical concentration and hydrothermal temperatures regimes. According to TEM results the cube axes are [0 0 1] direction and the side surfaces are {1 1 0} planes. A growth mechanism of SnO₂ cube-shaped crystals has been proposed.