Vapor-Solid Growth of Highly Oriented SnO_2 Nanorods for Chemical Sensing Applications.

C.G. Carvajal, C.S Davis, A.K. Pradhan.
Center for Materials Research, Norfolk State University, Norfolk, VA 23504, USA

SnO_2 nanorods have been successfully grown on large scale area from different substrates by the solid-liquid-vapor-solid technique. Tin chloride and zinc chloride powders were used as starting materials. Surface morphologies and structural properties of the SnO_2 nanorods were characterized by scanning electron microscopy (SEM), X-ray diffraction (XRD) and complementary experiments. The SEM shows distinct hierarchical growth of SnO_2 as well as the mixture with ZnO and the system was optimized to grow SnO_2 selectively. The structural results demonstrate tetragonal configuration of SnO_2 nanorods with square-shaped facets which are 20-60nm in cross section size and several hundreds of nanometer in length. Also, the nanorod size can be modified by changing the vapor-solid deposition parameters.

Chemical detection sensitivity of the as-prepared nanorods and other nanostructures was studied. Initial results demonstrate that the nanostructures are very sensitive to organic solvents as well as glucose. The cytotoxicity test of nanorods will also be presented.

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