

Growth and Properties of Doped and Undoped Complex ZnO Nanostructures

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Here, we present the growth and optical properties of hierarchical ZnO nanostructures composed of hexagonal ZnO nanorods synthesized by the simple thermal evaporation process using metallic zinc powder in the presence of oxygen. The hexagonal nanorods are grown over the six-facets of core nanorod. The typical lengths and diameters of the grown nanorods are about 1.5 – 2 μm and 30 – 40 nm respectively. The detailed structural characterizations by HRTEM, XRD and SAED confirmed that the as-grown ZnO branched structures are single crystalline and all the nanorods in the branched structure is grown along the [0002] direction in preference. The detailed optical properties of these structures confirmed the good optical properties for the as-grown structures. Finally, a plausible growth mechanism has been proposed for the formation of these branched ZnO structures.