

Growth of Solution Processed ZnO Nanorods/Nanotubes for p-n Junction Based Devices

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Zinc oxide (ZnO) as an n-type semiconductor with direct wide band gap energy of 3.37 eV demonstrates great potentials for use in blue-ultraviolet (UV) semiconductor lasers, light emitting diodes, and other optoelectronic devices. Due to its wide application, we have adopted simple and straight forward approach for the growth of ZnO nanorods using zinc nitrate hexahydrate and hexamethylenetetramine without addition of any based source (i.e. NaOH) at 80 °C via simple solution process. Further, ZnO nanorods were converted in to ZnO nanotubes using potassium chloride as an etchant. The crystallinity and structural properties of as synthesized ZnO nanorods and nanotubes were further characterized by various analytical tools. Heterojunction CuO/ZnO based devices have been fabricated using solution-based growth methods. Optical activity of as-fabricated p-n junction was characterized by photoluminescence (PL) measurement.