

Synthesis, characterization and growth mechanism of zinc oxide nanostructures via solution method

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Semiconductor ZnO is an important material which has various applications in solar cells, chemical and biological sensors, optoelectronic devices, surface acoustic wave guides, light emitting diodes, laser diode, photo-catalysts, actuators, photovoltaic, piezoelectric transducers with a direct wide band gap (3.37eV) and high exciton binding energy (60 MeV) at room-temperature, presenting itself as a promising material for the wide range of well-know technological as well as an important functional material for the future research and applications. In this connection different shaped zinc oxide nanostructures were synthesized at ~90°C by refluxing process at different refluxing time (6, 12, 18 and 24 hours) intervals via solution method. Heterostructures like needle, bamboo, Pencil and square shaped zinc oxide micro-particles were observed using FESEM, TEM and HRTEM observations. It reveals that the nanostructures grew along [0001] direction with an ideal lattice fringe distance of 0.52nm.