

Template-less surfactant-free and seedless aqueous route to the synthesis of single crystal ZnO nanowires

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A convenient template-less, surfactant-free, and seedless aqueous route has been employed to synthesize ZnO nanowires. Field emission scanning electron microscopy shows that product exhibits high density of ZnO nanowires and clearly indicates the uniformity straightness along longitudinal axis and level of perfection achieved through this soft solution approach. Moreover these nanowires have diameter between 20 to 30 nm and their length upto several micrometers. Transmission electron microscopy and XRD shows that obtained high aspect ratio ZnO nanowires are single crystalline with wurtzite hexagonal phase. This novel and efficient pathway is based on experimental monitoring of temperature, prolonged reaction time, pH nucleation and growth process. Nucleation and growth process was discussed to elucidate mechanism of formation of single crystal ZnO nanowires.