

Optical Features of Catalyst-free Zinc Oxide Nanostructures Confined to one Dimension *

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We successfully fabricated polycrystalline zinc oxide catalyst-free nanorods by a successive ion layer adsorption and reaction process. We measured their optical transmittance, reflectance and thickness in addition to performing X-ray diffraction and probing film microscopic topology. We extracted different optical constants such as absorption coefficient, band gap, complex refractive index and complex dielectric function and inferred the behavior of the optical conductivity and show the supremacy of the obtained ZnO nanostructure over a bulk material. It turns out that it is possible to obtain ZnO nanorods ultra-thin film with optical quality almost similar to those obtained by a contaminant metal catalyst approach requiring extra cost.

Key words: nanorods, catalyst-free, zinc oxide, optical constants, SILAR, quantum confinement, downscaling.

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