

## Two-step growth of perfectly hexagonal-shaped ZnO nanowires and nanorods on silicon substrate by thermal evaporation: structural and optical properties

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With the single-crystalline, perfect hexagonal shaped ZnO nanowires and nanorods have been grown on Au-coated silicon substrate via thermal evaporation method using the metallic zinc powder in presence of oxygen at temperature ranges between 550–450°C. Detailed structural analyses reveal that the obtained nanowires and nanorods are in wurtzite hexagonal phase and are preferentially oriented in the c-axis, [0001] direction. The detailed optical properties were studied by Raman and photoluminescence measurements at room temperature. Raman scattering has bespoken a good crystal quality with wurtzite hexagonal crystal structure while the room-temperature photoluminescence spectra showed sharp and strong UV emission with a suppressed green emission for both the nanostructures.