

Structural and optical properties of ZnO nanowires grown by rapid thermal chemical vapour deposition

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Catalysts free ZnO nanowires were grown on Si (100) substrates using rapid thermal chemical vapour deposition (RTCVD) at various growth conditions using metallic Zn powder as the source material. Further examinations of the growth conditions of ZnO nanowires observed in electron microscopy implied that the ZnO nanowire growth was favoured by high flow rate of oxygen gas supply and high growth temperature ($T_g = 600 \text{ }^\circ\text{C}$). The structural, surface morphology and optical properties of ZnO nanowires were systematically investigated by means of x-ray diffraction, Field Emission Scanning Electron Microscope (FE-SEM) and Photoluminescence (PL) respectively. Photoluminescence spectroscopy showed that nanowires have better optical qualities. These results indicate that one can obtain ZnO nanowires by selecting the growth temperature and oxygen flow rate.