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Effect of growth temperature on structural and luminescence properties of ZnO nanoparticles by Sol-Gel method

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Abstract content (Max 300 words) http://events.saip.org.za/getFile.py/a/target=_blank **Formatting & Special chars**

ZnO nanoparticles were synthesized by Sol-gel method at different temperatures. The effects of growth temperature on the structure and optical properties of ZnO nanostructures were investigated in detail. Temperature is an important thermodynamic factor that plays a key role in controlling the growth rate of a crystal, the morphology and aspect ratio of ZnO nanostructures. The characterization of the nanoparticles with Scanning Electron Microscopy (SEM) showed that at low temperatures (35 °C and 45°C) densely packed conglomerates of ZnO nanoparticles were observed. As the growth temperatures increases to 65 °C and 75°C, ZnO nanoparticles, hexagonal in cross-section and with needle-shaped tips were produced. The X-ray Diffraction (XRD) patterns, for samples grown at 35°C, a peak at 33° related to zinc hydroxyl double salts (Zn(OH)₂) was observed in addition to peaks related to the wurtzite structure of ZnO [1], indicating that growth at temperatures lower than 40 °C resulted in the formation of both ZnO and Zinc hydroxide . A highly crystalline nanoparticles were grown at temperatures greater than 45°C. Using UV-Vis absorption measurements the spectra showed the existence of peaks related to ZnO for temperatures as low as 35 °C.

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Yes

Level for award (Hons, MSc, PhD)?

MSc

Main supervisor (name and email) and his / her institution

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Yes

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