

Synthesis and room-temperature ferromagnetism in flower-like SnO₂ nanostructures

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Abstract. The flower-like nanostructures of SnO₂ were successfully synthesized by a simple hydrothermal method. The structure of the flower-like samples was investigated by X-ray diffraction (XRD). The samples revealed the single phase of SnO₂ tetragonal structure. The corresponding selected-area electron diffraction (SAED) analysis further confirmed the formation of the tetragonal structure of SnO₂ without secondary phases. The UV-visible spectroscopy showed the absorption peaks of SnO₂ flower-like samples in ultraviolet region centered at approximately 275 nm (4.37 eV). The estimated band gap of the samples was in the range of 3.47-3.52 eV. The magnetic properties were investigated by VSM. The flower-like sample prepared at 180°C for 48 h exhibits a diamagnetic behavior, whereas the sample prepared at 180°C for 24 h is ferromagnetic having the saturation magnetization of 0.574 memu/g at 15 kOe.

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