

**Hydrothermal Synthesis and Structural Properties of V<sub>2</sub>O<sub>5</sub> Nanoflowers at Low Temperatures**

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**Abstract:** Vanadium pentoxide nanoflowers were synthesized through a simple hydrothermal method at low temperatures. The structure was fabricated using NH<sub>4</sub>VO<sub>3</sub> and oxalic acid as precursors with 0.1 M concentration. The morphology and structure of the nanoflowers were characterized by FESEM, XRD, Raman, and UV-Visible spectroscopy. The results reveal an orthorhombic structure with preferred orientation along (001) plane of the prepared V<sub>2</sub>O<sub>5</sub> nanoflowers. Characteristic Raman peaks also expressed the same structural features. Microstructure analysis by FESEM showed the nanoflower structure of V<sub>2</sub>O<sub>5</sub> with diameters in the range of 60-80 nm and length in 600-800 nm. A red-shift is observed in the characteristic absorption peak of V<sub>2</sub>O<sub>5</sub>, with the annealing, which attributed to the decrease of the bandgap of the samples.

**Keywords:** V<sub>2</sub>O<sub>5</sub>; Hydrothermal synthesis; Nanoflowers; structural properties