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Phase evolution of vanadium oxides obtained through temperature programmed annealing of ammonium vanadate in hydrogen atmosphere

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

The possibility of obtaining vanadium dioxide (VO₂) [wherein the vanadium ionic state is 4+] from a precursor of ammonium metavanadate (NH₄VO₃) bearing the ion V⁵⁺ is investigated.

The reduction is carried out by annealing the NH₄VO₃ powders in similar concentrations of H₂ flow at varying temperatures. The resulting powders have been studied by several techniques including X-ray diffraction (XRD), Raman spectroscopy, Fourier transform infrared spectroscopy (FTIR), Transmission electron microscope (TEM), Brunauer-Emmett-Teller (BET) and Differential scanning calorimetry (DSC). It is found that remnants of bright yellow V⁵⁺ still exist up to annealing temperatures of 100 °C after which the sky-blue VO₂ dominates at annealing temperatures of 150 °C to 250 °C. There is a population surge of metastable dark-blue V₆O₁₃ (where V is in between V⁴⁺ and V⁵⁺ ionic states) between 250 °C and 300 °C. However above 350 °C the material reverts to the stable V⁵⁺ in the yellow-orange V₂O₅.

Apply to be considered for a student award (Yes / No)?

Yes

Level for award (Hons, MSc, PhD)?

MSc

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

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Would you like to submit a short paper for the Conference Proceedings (Yes / No)?

NO

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