

SIMPLE THERMAL DECOMPOSITION SYNTHESIS OF THERMOCHROMIC VO₂

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Pure monoclinic P2₁/c VO₂ thermochromic ceramics were fabricated by an accessible and simple method using the thermal decomposition synthesis in an organic medium. Well-developed submicron crystals with different morphologies were obtained when calcination temperature was varied 500 to 700 °C. XRD showed that calcination temperature is necessary to form the monoclinic thermochromic phase and obtain a high crystallinity. Thermodiffraction analysis reveals the structural reversibility of the monoclinic-rutile-monoclinic structure during the phase transition. DSC analysis showed the hysteretic thermochromic transition between 60 and 70 °C. Diffuse reflectance spectra as a function of temperature, in the visible and near-infrared ranges, exhibit VO₂ metal-insulator phase transition changes in agreement with DSC analysis and thermodiffraction. Our results show that thermal decomposition, used for the first time, can be successfully implemented to synthesize VO₂ with high quality and reproducibility.

Keywords: thermal decomposition synthesis, thermochromic, Thermodiffraction

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