

SYNTHESIS AND CHARACTERIZATION OF NANOCRYSTALLINE V₂O₅ POWDERS BY HYDROTHERMAL METHOD

GOCMEZ Hasan, TUNCER Mustafa, CETN Seher, VAKIFAHMETOGLU Cekdar

Dumlupinar University, Kutahya, Turkey

Abstract

Vanadium oxide nanopowders were obtained by hydrothermal process under the condition of 170 and 180 oC of temperature. The phase structure and morphology of nanocrystalline vanadium oxide powders were carried out with X-ray diffraction (XRD) and Scanning Electron Microscopy (SEM). Thermo mechanical analysis (TMA) was conducted on the powders to inform densification behaviors. XRD results showed that well-crystallized V₂O₅ structure with crystalline size about 80 nm. The SEM results showed that when the temperature increases from 170 to 180 oC , different morphology of powders can be obtained. Higher nucleation rate was induced by rising of temperature, which hindered the growth rate of crystallites during hydrothermal precipitation. Furthermore, the weakly-agglomerated powders were obtained.

Keywords: Vanadium oxide, hydrothermal process, nanopowders

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