

Synthesis and Characterization of Vanadium Oxide Film by Sparking Method for Thermo-chromic Application

Thursday 21 May 2015 13:00 (3h 30m)

Vanadium dioxide (VO₂) has a great potential to be utilized as thermo-chromic glazing for improving the energy efficiency of buildings. The famous semiconductor-to-metal phase transition (SMT) property of VO₂ shows the reversible optical properties when the temperature is above the critical point at 68 °C. In this work, VO₂ films were prepared by sparking method on glass substrates and annealed for 2 –6 hours at 300 –500 °C. Thickness of VO₂ films was varied from 100 to 500 nm by increasing the sparking cycles. The surface morphology of samples was analyzed by atomic force microscopy and scanning electron microscopy. The solar reflectance and transmittance were investigated by UV-Vis-NIR spectroscopy. The results show that the roughness of the films was decreased by rising the annealing temperatures and the near-infrared transmittance trend of products were dropped down by controlling the working temperatures from 30 to 90 °C.

Author: Mr THONGPAN, Winai (Materials Science Research Center, Department of Physics and Materials Science, Faculty of Science, Chiang Mai University, Chiang Mai, THAILAND 50200)

Co-author: Prof. SINGJAI, Pisith (Materials Science Research Center, Department of Physics and Materials Science, Faculty of Science, Chiang Mai University, Chiang Mai, THAILAND 50200)

Presenter: Mr THONGPAN, Winai (Materials Science Research Center, Department of Physics and Materials Science, Faculty of Science, Chiang Mai University, Chiang Mai, THAILAND 50200)

Session Classification: Poster-3

Track Classification: Material Physics, Nanoscale Physics and Nanotechnology