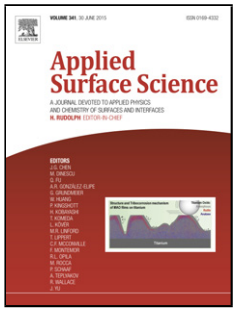
Accepted Manuscript



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PII: S0169-4332(15)02154-6
DOI: http://dx.doi.org/doi:10.1016/j.apsusc.2015.09.060
Reference: APSUSC 31274

To appear in: *APSUSC*

Received date: 9-5-2015
Revised date: 30-8-2015
Accepted date: 6-9-2015

Please cite this article as: I. Apostol, A. Mahajan, C.J.A. Monty, K.V. Saravanan, Nanostructured $MgTiO_3$ thick films obtained by Electrophoretic Deposition from nanopowders prepared by Solar PVD, *Applied Surface Science* (2015), http://dx.doi.org/10.1016/j.apsusc.2015.09.060

Nanostructured $MgTiO_3$ thick films obtained by Electrophoretic Deposition from nanopowders prepared by Solar PVD

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Abstract

A novel combination of Solar Physical Vapor Deposition (SPVD) and Electrophoretic Deposition (EPD) that was developed to grow $MgTiO_3$ nanostructured thick films is presented. Obtaining nanostructured $MgTiO_3$ thick films, which can replace bulk ceramic components, a major trend in electronic industry, is the main objective of this work. The advantage of SPVD is direct synthesis of nanopowders, while EPD is simple, fast and inexpensive technique for preparing thick films. SPVD technique was developed at CNRS-PROMES Laboratory, Odeillo-Font Romeu, France, while the EPD was performed at University of Aveiro – DeMAC/CICECO, Portugal. The nanopowders with an average crystallite size of about 30 nm prepared by SPVD were dispersed in 50 ml of acetone in basic media with addition of triethanolamine. The obtained well-dispersed and stable suspensions were used for carrying out EPD on 25 μm thick platinum foils. After deposition, films with thickness of about 22-25 μm were sintered in air for 15 minutes at 800, 900 and 1000°C. The structural and microstructural characterization of the sintered thick films was carried out using XRD and SEM, respectively. The thickness of the sintered samples were about 18-20 μm, which was determined by cross-sectional SEM. Films sintered at 900°C exhibit a

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