

Accepted Manuscript

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

Author: Irina Apostol Amit Mahajan Claude J.A. Monty K. Venkata Saravanan



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>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Nanostructured MgTiO₃ thick films obtained by Electrophoretic Deposition from nanopowders prepared by Solar PVD

Irina Apostol ^a, Amit Mahajan ^b, Claude J. A. Monty ^c, K. Venkata Saravanan ^{b,d,*}

^a S.C. IPEE Amiral Trading Impex S.A., 115300 Curtea de Arges, Romania

^b Department of Materials and Ceramics Engineering, Centre for Research in Ceramics and Composite Materials, CICECO, University of Aveiro, 3810-093 Aveiro, Portugal

^c CNRS-PROMES Laboratory, Odeillo 66120 Font Romeu, France

^d Department of Phys., School of Basic and Applied Science, Central University of TamilNadu, Thiruvavur – 61010, India

Abstract

A novel combination of Solar Physical Vapor Deposition (SPVD) and Electrophoretic Deposition (EPD) that was developed to grow MgTiO₃ nanostructured thick films is presented. Obtaining nanostructured MgTiO₃ 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

* Author to whom correspondence should be addressed.

E-mail: venketvs@cutn.ac.in
Tel.: +91-9943260517

Download English Version:

<https://daneshyari.com/en/article/5353987>

Download Persian Version:

<https://daneshyari.com/article/5353987>

[Daneshyari.com](https://daneshyari.com)