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G. Orozco-Hernández, J.J. Olaya, J.E. Alfonso, C.A. Pineda-Vargas, C. Mtshali



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OPTICAL RESPONSE OF BISMUTH BASED THIN FILMS SYNTHESIZED VIA UNBALANCED MAGNETRON DC SPUTTERING TECHNIQUE

G. Orozco-Hernández^{a,b},

^a Departamento de Ingeniería Mecánica y Mecatrónica, Facultad de Ingeniería, Universidad Nacional de Colombia sede Bogotá, AA 111321, Bogotá – Colombia, email: gorozcohe@unal.edu.co

^b Universidad ECCI, Cra 19 No. 49-20, Bogotá – Colombia.

J.J. Olaya^a

^a Departamento de Ingeniería Mecánica y Mecatrónica, Facultad de Ingeniería, Universidad Nacional de Colombia sede Bogotá, AA 111321, Bogotá – Colombia, email: jjolayaf@unal.edu.co

J.E. Alfonso^{c,*}

^c Departamento de Física, Facultad de Ciencias, Universidad Nacional de Colombia sede Bogotá, AA 111321, Bogotá – Colombia, email: jealfonsoo@unal.edu.co

C.A. Pineda-Vargas^d

^d iThemba LABS, National Research Foundation, PO Box 722, Somerset west 7129, Cape Town – South Africa, email: pineda@tlabs.ac.za

C. Mtshali^{d,e}

^d iThemba LABS, National Research Foundation, PO Box 722, Somerset west 7129, Cape Town – South Africa

^e Faculty of Health & Wellness Sciences, CPUT, Bellville, South Africa, email: mtshali@tlabs.ac.za

*Corresponding author: email: jealfonsoo@unal.edu.co, mobile phone: +573115060647

ABSTRACT

Bismuth-based thin films were deposited on AISI 316L stainless steel and glass substrates via the unbalanced magnetron DC sputtering technique. Three different configurations of titanium pieces along the bismuth target race track were used in order to evaluate the influence of Ti content on the optical and electrical properties of the films. We used a reactive ambient mixture of Ar:O (80%:20%) and a constant flux of 9 sccm, along with a power of 40 W. Results showed thin films with high homogeneity and smooth surfaces, with several bismuth droplets, in all the different configurations. It was also found that the optical and electrical properties of the thin films are strongly dependent on the preparation conditions, especially the Ti content. Titanium quantities in the parts-per-million range were found only through the micro-proton induced X-Ray emission technique. This small

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