Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Structure, composition and optical band gap of TiO_2 films prepared by d.c. magnetron sputtering[1] M.E. GOMEZ, A. ARIAS, E. CAMPS, L. ESCOBAR-ALARCON, F. ESPINOZA, J. MUNOZ-SALDANA, G.A. MENDOZA, G. ZAMBRANO, UNIVERSIDAD DEL VALLE, COLOMBIA TEAM, INSTITUTO DE INVESTIGACIONES NUCLEARES (ININ), MEXICO TEAM, CINVESTAV, QUERÉTARO, MEXICO TEAM, UNIVERSIDAD NACIONAL DE COLOMBIA, BOGOTA TEAM — Titanium dioxide (TiO_2) thin films have been grown on silicon (001) substrate by d.c. magnetron sputtering. in an gas mixture at different Ar/O_2 ratio flow and at two different substrate temperatures (400 and 550 °C). Samples were characterized by X-ray diffraction, XRD, Raman spectroscopy, Scanning Electron Microscopy (SEM), Fourier Transformed Infrared Spectroscopy (FTIR) and UV-Vis analysis. Results showed that we obtained TiO_2-Anatase phase for the 90/10 of Ar/O_2 ratio in the gas mixture and at substrate temperature of 400 °C. The anatase phase proportion in the films decreases by increasing the oxygen concentration in the Ar/O_2 gas mixture. Optical band gap of 2.9 and 2.7 eV was calculated from UV-Vis spectra for sample grown at 90/10 and 80/20 of Ar/O_2 ratio, respectively.

[1] Acknowledgments: This work has been partially supported by CENM-COLCIENCIAS contract 043-2005. Authors thank Department of Chemistry at Universidad del Valle for FTIR measurements.

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Date submitted: 26 Nov 2008 Electronic form version 1.4