

Nanostructured SnO<sub>2</sub>-SiO<sub>2</sub> glassceramic thin films for photonic applications

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Transparent optically guiding silica-based films with relatively low electrical resistivity were obtained by deposition of nanostructured SiO<sub>2</sub> glassceramics containing a high density of monodispersed, nanometer sized, clusters of SnO<sub>2</sub>. A particular sol-gel derived synthesis was employed, assuring the homogeneous nanosized clustering of the semiconducting SnO<sub>2</sub> phase [1,2] and suitable sol features for achieving thick single-step deposition by spin-coating techniques. Refractive index and thickness were analyzed in films produced in different synthesis conditions and thermal treatment of densification. Spectroscopic measurements were carried out on films on silica substrate and bulk samples. The current-voltage response was also analyzed in samples deposited on substrate. Current - voltage measurement, breaking voltage and photo-induced effects in this material were investigated.

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[2] N. Chiodini, A. Paleari, D. Di Martino, G. Spinolo, "SnO<sub>2</sub> nanocrystals in SiO<sub>2</sub>: a wide band-gap quantum dot system", *Appl. Phys. Lett.*, 81, 1702, (2002).