

Abstract Submitted
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Preparation and Characterization of Ta₂O₅-CeO₂ Films DURSEN SAYGIN HINCZEWSKI, Istanbul Technical University (I.T.U.), KENAN KOC, Yildiz Technical Univ., IDRIS SORAR, I.T.U., MICHAEL HINCZEWSKI, TUBITAK Bosphorus Univ. Feza Gursey Institute, FATMA Z. TEPEHAN, I.T.U., GALIP G. TEPEHAN, Kadir Has Univ. — Ta₂O₅ films have been widely studied due to their chemical and thermal stability, high dielectric constant and refractive index. It is known, for certain composites of Ta₂O₅-TiO₂, Ta₂O₅-Al₂O₃, and Ta₂O₅-ZrO₂ polycrystalline ceramics, that there is a significant increase in the dielectric constant compared to pure Ta₂O₅; this has stimulated research of doped thin films of Ta₂O₅. In this study [1], the sol-gel spin coating method has been used to make Ta₂O₅-CeO₂ thin films. These films have been prepared in various composition ratios to observe changes in their surface morphology, optical and structural properties. Reflectance and transmittance spectra were collected in the spectral range of 300-1000 nm, and were accurately fit using the Tauc-Lorentz model. Film thicknesses, refractive indices, absorption coefficients, and optical band gaps were extracted from the theoretical fit. The highest refractive index value was found at 5% CeO₂-doping. The structure of the films was characterized by XRD and FTIR spectrometry, while the surface morphology was examined through AFM. [1] D. Saygin-Hinczewski, K. Koc, I. Sorar, M. Hinczewski, F.Z. Tepehan, and G.G. Tepehan, Sol. Energy Mater. Sol. Cells 91, 1726 (2007).

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