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The study of structural and optical properties of TiO_2:Tb thin films

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Keywords

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Abstract

This work presents the study of the structural and optical properties of TiO_2:Tb thin films deposited on Si (100) and SiO_2 substrates by magnetron sputtering from metallic Ti-Tb mosaic target. Thin films were studied by means of scanning electron microscopy with energy disperse spectrometer (SEM-EDS), atomic force microscopy (AFM), X-ray diffraction (XRD) and the optical transmission method. From SEM-EDS the total amount of Tb concentration was determined. XRD analysis revealed the existence of crystalline TiO_2 in the form of anatase and rutile, depending on Tb amount in the examined samples. The optical transmission method has shown that Tb doping shifts the fundamental absorption edge of TiO_2 toward the longer wavelength region.