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The design of an antireflective filter using TiO_2 - ZnO and TiO_2 thin films DURSEN SAYGIN HINCZEWSKI, Dept. of Physics, Istanbul Technical University, MICHAEL HINCZEWSKI, Feza Gursev Institute, IDRIS SORAR, FATMA Z. TEPEHAN, Dept. of Physics, Istanbul Technical University, GALIP G. TEPEHAN, Fac. of Arts and Sciences, Kadir Has University — In the present work, we designed an antireflective filter for the visible region composed of TiO_2 and ZnO-TiO_2 thin films. Initially, single layers of the films were coated on both sides of the substrate using the sol-gel spin coating method. UV-visible spectroscopy was used to measure the transmittance and reflectance of the films. The thicknesses, refractive indices and extinction coefficients were determined by fitting to a modified Tauc-Lorentz model. Having determined the appropriate film thicknesses and refractive indices needed for an antireflective filter in the desired wavelength region, the single layers were combined to build the filter. The theoretical model of Ref.[1], which accounts for the densification occurring during the construction of the multilayer stack, was adapted to extract the optical properties of the individual layers in the stack, which were then compared to the single layer results. [1] D. Saygin Hinczewski, M. Hinczewski, F.Z. Tepehan and G.G. Tepehan, Solar Energy Materials and Solar Cells 87, 181 (2005).

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