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Structural and optical study of titanium dioxide thin films elaborated by APCVD for application in silicon solar cells

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Abstract. In this work, the structural, electrical and optical properties of the TiO_2 thin films deposited by APCVD were evaluated by Atomic force microscopy, Four-point probe, and Spectroscopic ellipsometry, respectively. Our experimental results show that the deposited TiO_2 films were polycrystalline and relatively smooth. The measured average transmittance was about 85-90%. The refractive index of our TiO_2 thin films was found to be n=2,25 at the wavelength λ= 550 nm, with a thickness of 56,2 nm, which are in excellent agreement with the calculations results of the TiO_2 refractive index and thickness required for a high quality antireflection coating in industrial conditions.