

Accepted Manuscript

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PII: S0040-6090(17)30924-0
DOI: <https://doi.org/10.1016/j.tsf.2017.12.019>
Reference: TSF 36393
To appear in: *Thin Solid Films*
Received date: 19 April 2017
Revised date: 12 December 2017
Accepted date: 19 December 2017

Please cite this article as: A. Pazidis, R. Reineke-Koch , Magnetron sputtered TiO_x layers: Structural, electrical, optical and thermochromic aspects. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Tsf(2017), <https://doi.org/10.1016/j.tsf.2017.12.019>

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Magnetron sputtered TiO_x layers: structural, electrical, optical and thermochromic aspects

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Abstract

Titanium oxide layers were prepared by sputter deposition with plasma emission monitoring in the whole stoichiometry range between Ti and TiO_2 without and with substrate heating to 240 °C. The layers were characterized with regard to their crystal structure and specific resistance. Optical constants were determined in the spectral range between 240 nm and 38 μm . The thermochromic behavior of a prepared Ti_2O_3 layer was measured and compared to calculations for bulk material.

Keywords

solar thermal collector; titanium oxide; thermochromic absorber

1. Introduction

Sub-stoichiometric titanium oxides and oxynitrides are used as absorber materials for solar thermal collectors [1]. But although a variety of thin film deposition techniques have been reported for the

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