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On the Hydrophilicity of Ni-Doped TiO₂ Thin Films. A Study by X-Ray**Absorption Spectroscopy.**

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Abstract

Undoped and Ni-doped TiO₂ thin films, with Ni concentration in the range 3-9 at.%, were obtained by reactive magnetron co-sputtering. A combined analysis by X-ray photoelectron spectroscopy and extended X-ray absorption-edge fine structure shows that Ni²⁺ substitutes for Ti⁴⁺ in the TiO₂ lattice and promotes, at higher Ni amounts, a structural transition of the host from anatase to rutile. Several difficulties of the extended X-ray absorption-edge fine structure analysis, in the case of Ni-doped TiO₂, are also discussed. X-ray diffraction data revealed that a large amount of the films material is in amorphous state. The films are very smooth, with root mean square roughness values (below 1.5 nm) decreasing with the increase of the Ni content. The hydrophilic properties of TiO₂, modified by Ni doping, are also investigated.

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