

Applied Physics Letters 2006 vol.89 N18

Spin polarization of oxygen atoms in ferromagnetic Co-doped rutile TiO₂

Nefedov A., Akdogan N., Zabel H., Khaibullin R., Tagirov L.
Kazan Federal University, 420008, Kremlevskaya 18, Kazan, Russia

Abstract

Of central interest in the research of dilute magnetic semiconductors is the coupling mechanism leading to a ferromagnetic ground state. Using x-ray resonant magnetic scattering, we have analyzed the element specific magnetic hysteresis curves of Co, Ti, and oxygen in Co-doped TiO₂ synthesized by ion implantation. Magnetic dichroism was observed at the Co L_{2,3} edges, as well as at the O K edge, indicative of a spin polarization of oxygen atoms in the TiO₂ host matrix. The hysteretic shapes and the coercive field values measured at the Co L₃ and O K edges are identical (1.9 kOe at 30 K). © 2006 American Institute of Physics.

<http://dx.doi.org/10.1063/1.2378398>
