文献

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Optical and magnetic properties of mixed crystal Ti0.95Ni0.05O2 films deposited on Si substrates by sol-gel method
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抄録 (Abstract)
Ni-doped mixed crystal TiO2 films, Ti0.95Ni0.05O2, were fabricated on Si(100) substrates by sol-gel process. The influences of annealing times on the structural, optical and magnetic properties were investigated. X-ray diffraction measurement indicates that all the films include anatase and rutile phases. The optical constants were obtained by fitting ellipsometric spectra with Adachi's dielectric function model. With increasing rutile content, both the refractive index and the extinction coefficient of the films increase, but the optical band gap EOBG is reduced. The refractive index at 600nm abides by Drude's refractive index model with increasing rutile fraction. The magnetic evolution of the films is from ferromagnetic, to paramagnetic and then ferromagnetic states with increasing rutile fraction, which may be related to the magnetic polarons in the Ni-doped TiO2 films. The results indicate that optical and magnetic properties of Ni-doped TiO2 films can be tuned by controlling phase fraction. © 2013 The Authors.

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