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Room temperature ferromagnetism in highly-resistive Ni-doped TiO_2 films prepared by sol-gel method DONGHO KIM, JONGHO CHO, YOUNGGULL JOH, Yeungnam University, KEEJOO LEE, Choongnam National University — We investigated the magnetic and transport properties of Ni-doped TiO_2 films grown by a sol-gel method with Ni concentrations from 1% to 8%. All the samples exhibited ferromagnetism at room temperature identified by optical magnetic circular dichroism (MCD)along with SQUID measurement. For the samples with low Ni concentrations, both results argee each other, however, MCD results of 8% Ni-doped sample showed a noticeable difference in the temperature dependence of the coercive field and the saturation magnetization from the SQUID results. The Hall effect study showed that the carriers are electrons with densities lower than $10^{18}cm^3$ at room temperature, but no anomalous Hall effect has been observed due to the high resistivity of our samples. The observation of ferromagnetism in highly-resistive Ni-doped TiO_2 films questions the carrier-mediated exchange interaction as an origin of ferromagnetism in this material.

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