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Doping effect of indium oxide-based diluted magnetic semiconductor thin films

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Abstract

Transition metal (TM = Mn, Fe, and Co) doped $In_{2-x}TM_xO_3(0.0 \leqslant x \leqslant 1.0)$ nanostructure thin films have been successfully prepared by means of sol–gel process onto $SiO_2/Si(1\,0\,0)$, Corning 7059 glass and MgO(1 0 0) substrates annealed at 600°C in oxygen atmosphere. Room temperature magnetic hysteresis curve showed an ferromagnetic behavior and this result clearly indicates that the $In_{2-x}TM_xO_3$ thin films are advantageous not only for practical application to magnetic device but also for physical basic studies on electro-magnetic properties of $In_{2-x}TM_xO_3$ films.

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