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Preparation of Dilute Magnetic Oxide Thin Films by Reactive-Biased Target-Ion Beam-Sputter Deposition KEVIN G. WEST, JIWEI LU, JIANI YU, WEI CHEN, YONGHANG PEI, LI HE, STUART A. WOLF, University of Virginia — We have used reactive-biased target-ion beam-sputter deposition to prepare $Co_xTi_{1-x}O_2$thin films on $LaAlO_3$ (100) and $SrTiO_3$(100) substrates for $0.005<x<0.06$. The influence of the growth parameters on the microstructure, magnetic and transport properties of $Co_xTi_{1-x}O_2$was systematically investigated. Both pure anatase phase and mixed anatase/rutile phases of TiO_2 films were obtained by varying the growth conditions and subsequently demonstrated different magnetic and transport properties. All samples show a curie temperature higher than 300 K. The pure anatase $Co_xTi_{1-x}O_2$thin films have saturated magnetic moments of 1$\sim$2 μ_B/Co at 10 K. The presence of rutile phase seems to greatly enhance the moments at lower temperatures.

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