

Abstract Submitted  
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**Magnetic Properties of Co-doped HfO<sub>2</sub>** Y.S. CHANG, W.C. LEE, M.L. HUANG, Z.K. YANG, M. HONG, Dept. of Materials science and Engineering, National Tsing Hua University, Taiwan, S.F. LEE, Inst. of Phys., Academia Sinica, Nankang, Taiwan, L. GONCHAROVA, T. GUSTAFSSON, Physics Dept., Rutgers Univ., Piscataway, NJ, USA, M.C. HANG, Y.L. SOO, J. KWO, Dept. of Physics, National Tsing Hua Univ., Taiwan — Dilutely doped Co in HfO<sub>2</sub> films were recently reported to show strong enhancement of Co magnetic moments. We have systematically studied the structural, chemical, and magnetic properties of HfO<sub>2</sub> epitaxial films  $\sim 1000\text{\AA}$  thick grown on YSZ with Co doping concentrations of 1, 2, 4, and 20 atomic percent. The crystal structures of these samples are predominantly monoclinic, and the XPS Co spectra also indicate the co-existence of cobalt metals and cobalt oxides. Tendency to form Co metal clusters in high doping concentrations was also observed by EXAFS. M-H loops at 10K and 300K by SQUID magnetometer were clearly seen for samples with Co doping of 4% and higher. But no evidence for strong moment enhancement was found. However, our magnetic measurement do showed the unusual decay of magnetic moment with time, which was also seen in Co-doped SnO<sub>2</sub> films.

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