

Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Anomalous magnetic behaviors in $\text{AlO}_x/\text{Co}_{84}\text{Fe}_{16}$ Tunneling Magnetoresistance (TMR) systems induced by the interfacial oxidations K.-J. RHO, POSTECH, K.-J. KIM, PLS, J.-Y. KIM, PLS, J.-H. PARK, POSTECH/PLS, J.-S. LEE, POSTECH, K.-B. LEE, POSTECH, S. J. JOO, KIST, K. RHIE, Korea University — Due to the practical application of the magnetic tunnel junction as magnetic memory cells and sensors, tunneling magnetoresistance (TMR) in the magnetic tunnel junction (MTJ) has been very actively studied, and extensive effort has been exerted in order to improve the physical properties of MTJs. As a result, it is well recognized that the performance of the MTJs strongly depends on the environment at the interface between the magnetic layer and the insulating oxide layer. In spite of such critical importance, the interface environment and its effects on the magnetic behaviors have not been well understood yet. Here we present anomalous magnetic behaviors observed in $\text{AlO}_x/\text{Co}_{84}\text{Fe}_{16}$ magnetic tunnel junction structures prepared in various oxidation processes. We examined the magnetic behaviors using the magneto-optical Kerr effect (MOKE) measurements in vacuum. The system turns out to exhibit a strong temperature dependence of the magnetic coercive field, and the behavior consistently varies with the oxidation process. The interface environments and the origin of the anomalous behaviors will be also discussed based on x-ray reflectivity and diffraction results.

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Date submitted: 28 Nov 2005

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