

Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Sorting Category: 10.1.1 (E)

Modification of thickness dependent magnetic properties of perpendicular anisotropy Co/Pd multilayer upon hydrogenation¹ KINESHMA MUNBODH, FELIO PEREZ, DAVID LEDERMAN, West Virginia University — We have studied the change in saturation magnetization (M_S) and effective perpendicular anisotropy (K_{eff}) upon hydrogenation at room temperature and a pressure of one atmosphere in (Co/Pd)₂₅ multilayers, with Co thickness ≤ 5 Å and Pd thickness ranging from 0 Å to 25 Å. The change in M_S and K_{eff} was studied as a function of the x-ray scattering length density profile, generated from the x-ray reflectivity fits. The results show that when the Pd thickness ≤ 10 Å, the films were highly interdiffused, resulting in no measurable change in M_S and K_{eff} . As the thickness of Pd increases, the contrast between the Co and Pd layers increases, leading to a decrease in M_S and an increase in the component of magnetization in the plane of the samples and hence causing K_{eff} to decrease. The results clearly demonstrate that the solubility of hydrogen in the multilayer samples decreases with increasing alloying effects as it decreases the vacancy in the Pd *4d* band leading to no electronic transfer from the hydrogen atoms to the Pd.

¹This work was supported by the Department of Energy.

Prefer Oral Session
 Prefer Poster Session

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Date submitted: 28 Feb 2012

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