Thickness and surface-termination effects on magnetocrystalline anisotropy of FeM (M=Rh, Cr, and Pt) (001) thin films

SOYOUNG JEKAL, SUNG-HYON RHIM, SOON-CHEOL HONG, Univ of Ulsan — FeM (M=Rh, Cr, and Pt) alloys show diverse interesting physical properties, which attracted these alloys as a promising candidate for spintronics application. In this study, we investigate effects of thickness and surface-termination on magnetism and magnetocrystalline anisotropies (MCAs) on the CsCl-structured FeM(001) thin films, using Vienna Ab initio Simulation Package. Two surface terminations (Fe-terminated and M-terminated) and thicknesses from 3 to 15 monolayers are taken into account. We find that magnetism and MCAs are sensitive to the surface termination and the thickness, whose relevance to electronic structures will be discussed.

1Supported by Basic Research Program (2010-0008842) and by Priority Research Centers Program (2009-0093818) through National Research Foundation of Korea.

5X. Mart, et al.