

Competition of Shape and Magnetocrystalline Anisotropy of B2 Type FeCo Structure

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Using the full potential linearized augmented plane wave (FLAPW) method, we have investigated the effect of Fe adlayer and Co underlayer on the magnetic properties of Fe/FeCo/Cu(001) and Fe/FeCo/Co/Cu(001) systems. It is found that the magnetic layers display very close to half metallic state and this is independent on Fe adlayer thickness or Co underlayer. The pure FeCo/Cu(001) has an in-plane magnetic anisotropy and the Co underlayer induces a perpendicular magnetic anisotropy. Besides, the spin reorientation transition (SRT) is realized with increasing Fe adlayer thickness. Both Fe/FeCo/Cu(001) and Fe/FeCo/Co/Cu(001) systems manifest similar behavior although the strength of anisotropy energy is different. The thickness dependent magnetic anisotropy is interpreted in terms of shape and magnetocrystalline anisotropy.