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Annealing Effects on Surface Morphology of IrMn Thin Films

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IrMn alloy has been intensively studied during last few years in order to improve exchange bias strength in magnetic storage. IrMn layer is usually coupling with a ferromagnetic layer to increase sensitivity in magnetic sensor due to its critical thickness. It can maintain high exchange strength even at ultra-thin layer. In this study, thermal annealing was performed at different temperatures in Ar atmosphere and air. The surface of as-deposited samples showed smooth surface and contain small grains. After annealing, surface grains exhibited flatter and larger for Ar-annealing. However for air annealing, some very large grains were developed on IrMn thin film surface. It was identified as Mn-Oxide by using micro-Raman spectroscopy. The effects of annealing temperature and annealing time on the formation of Mn-Oxide will be discussed during the presentation.

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