

Excellent Low Field Magnetoresistance Properties of Mn Ferrites

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A significant enhancement of low-field magnetoresistance (LFMR) could be achieved from Mn ferrites polycrystalline samples prepared by standard solid state reaction process in argon atmosphere at temperature of 1150~1250°C for 4h. The effects of the annealing temperature on the microstructure, magnetic and magneto-transport properties of the Mn ferrites were carefully investigated. Field dependency of magnetization was measured with a SQUID (superconducting quantum interference device) magnetometer, and low field magnetoresistance (LFMR) was also measured with the SQUID magnetometer using an external current source and voltmeter. The X-ray diffraction analyses revealed that all Mn ferrites of the spinel structure were a pure phase without the second phase. High LFMR ratio over 2.9% at 300K in 0.5 kOe was achievable from Mn ferrites sample annealed at 1200°C. The relationship among the annealing temperature, microstructure, magnetic and magnetotransport properties will be presented for a discussion.