Colossal Magnetoresistance of (La1-xDyx)0.67Sr0.33MnO3 Perovskite

ABSTRACT

In this work, colossal magnetoresistance (CMR) of (La1-xDyx)0.67Sr0.33MnO3 ceramic, with x=0.00, 0.20 and 0.40 were prepared using the solid-state reaction technique. The structures, surface profile, magnetic and electrical properties of the samples exhibit single phase rhombohedral distorted perovskite structures, which were caused by the Jahn-Teller distortion. Atomic Force Microscopy (AFM) analysis showed no significant change of grain size when Dy was substituted in La site. Magnetization analysis showed that Tc drop as the substitution concentration increased. The highest CMR value of 24.3% and 16.6% at 100K and 300K was observed in sample with x = 0.4 at 1 Tesla. Low field magnetoresistance effect had been observed for x = 0.00 and x= 0.20 sample. However, at high substitution concentration (x=0.40) LFMR effect tend to vanish.

Keyword: colossal magnetoresistance (CMR), perovskite