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Superparamagnetic properties of La1 - xSrxMn0.925Zn0.075O3 (x = 0.075, 0.095, and 0.115) lanthanum manganites

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Abstract

Lanthanum-strontium manganites doped with zinc are studied by the method of electron magnetic resonance. Nano-objects with ferromagnetically correlated spins, which behave themselves like superparamagnetic particles in the magnetic resonance spectrum, have been found in the paramagnetic phase. The temperature dependences of the resonance magnetic field and magnetic resonance linewidth for La1 - xSrxMn0.925Zn0.075O3 ceramic samples at temperatures ranging from 100 to 340 K have been analyzed on the basis of the Raikher-Stepanov theory of superparamagnetic particles. The magnetic moment, anisotropy field, and characteristic size of the regions of the ferromagnetically correlated spins have been determined. © 2013 Pleiades Publishing, Inc.

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