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**Phase separation of complex half-doped Sm0.32Pr0.18Sr0.5MnO3 manganite**

***G.V. Sarapin***

Phase separation and microscopic nature of the magnetoresistance at complex half-doped manganites for the 154Sm0.32Pr0.18Sr0.5MnO3 sample wasinvestigated by methods of high-resolution neutron powder diffraction and measurement of neutron depolarization, temperature dependences of magnetization and its second harmonic as well as electroresistance measuring. It was revealed the existence of a structural phase transition from a high-temperature orthorhombic *Pbnm* phase to a mixture of two phases: orthorhombic *Pbnm* and monoclinic *Р21/m* at *Т*≈ 170 K. Analysis of the magnetic contribution to the experimental neutron diffraction patterns at low temperatures indicates that the ground magnetic state of the investigated compound is a phase separation and is a mixture of three magnetic phases formed at different temperatures: ferromagnetic, *A*-type antiferromagnetic, and antiferromagnetic charge ordering *CE*-type. Ferromagnetic ordering forms in the region of room temperature in the orthorhombic *Pbnm* structure and manifests only in this phase down to liquid helium temperatures. Antiferromagnetic states of *A*-type (*ТN* ≈ 170 K) and *CE*-type (*ТN* ≈ 120 K) form in the monoclinic phase. It was described the microscopic nature of the magnetoresistance of the 154Sm0.32Pr0.18Sr0.5MnO3 manganite.

The list of publication:

1. G.V. Sarapin. Phase separation of complex half-doped Sm0.32Pr0.18Sr0.5MnO3 manganite // XLVII PNPI School on condensed state physics. Abstracts – Gatchina: P. ”PNPI” 2013.- 160 p.
2. G.V. Sarapin. Phase separation of complex half-doped 154Sm0.32Pr0.18Sr0.5MnO3 manganite // International Conference on Neutron Scattering – 2013. Abstracts – Edinburgh: P. ” Institute of Physics” 2013.- 189 p.
3. G.V. Sarapin. Phase separation of complex half-doped 154Sm0.32Pr0.18Sr0.5MnO3 manganite // RACIRI Summer school 2013. Abstracts – SPb: P. ” SOLO” 2013.- 76 p.