

MAGNETIC MICROSTRUCTURE AND ELECTRICAL PROPERTIES OF EUROPIUM FERROMANGANITES

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Crystalline structure, magnetic microstructure, electrical properties; conductivity, thermopower and magnetoresistance of perovskite-like europium ferromanganites were investigated. The $Eu_{0,65}Sr_{0,35}Mn_{1-x}Fe_xO_3$ ($x=0.2; 0.25; 0.3; 0.35; 0.4$) samples were prepared using the ceramic method from mixture of oxides. Fe-57 isotope was added to the concentration 20-25 % during synthesis. The single-phase nature of samples was controlled by X-ray diffraction. All ferromanganites were studied by Fe-57 and Eu-151 Mossbauer spectroscopy. The spectra of samples with low Fe concentration contain only paramagnetic doublet. The spectra of samples with $x=0,35$ and $x=0,4$ contain, beside quadrupole doublet, two Zeeman sextets with $H = 450$ kOe and relatively intensity of 50-60 %. All samples under investigations were n-type semiconductors. The activation energy of conductivity is 0,1 eV for all samples. This value is approximately 1/2 of energy gap, calculated for the rare-earth ferromanganites. In the $Eu_{0,65}Sr_{0,35}Fe_{0,4}Mn_{0,6}O_3$ we observed "bipolar" magnetoresistense: negative at the temperatures below 316 K, and positive at higher temperatures. Positive MR have value 12 % at relatively small field ($B \approx 0,6$).

9.7 cm

13.4 cm

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