

**STUDY OF THE TEMPERATURE DEPENDENCES OF HEAT CAPACITY
OF SOLID SOLUTIONS BASED ON HEXAGONAL
STRONTIUM FERRITES SUBSTITUTED WITH GALLIUM**

Zhivulina N.A.⁽¹⁾, *Zhivulin V.E.*⁽¹⁾, *Vinnik D.A.*^(1,2,3)

(1) South Ural State University

454080, Chelyabinsk, Lenina pr., 76

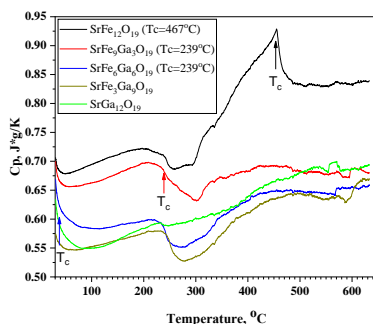
(2) Moscow Institute of Physics and Technology

1173031, Moscow, Kerchenskaya st., 1A

(3) St. Petersburg State University

199034, Saint Petersburg, Universitetskaya emb., 7–9

Synthesis of samples of the composition $\text{SrFe}_{12-x}\text{Ga}_x\text{O}_{19}$ was carried out using the solid-phase reaction method, with iron oxide (Fe_2O_3), gallium oxide (Ga_2O_3), and strontium carbonate (SrCO_3) as starting components. Sintering of the stoichiometric mixture was performed at a temperature of 1400 °C for 5 hours. X-ray phase analysis showed that the samples have a single crystalline phase belonging to the magnetoplumbite structure. Electron microscopy and EDS analysis confirmed the homogeneous distribution of elements throughout the sample volume.



Temperature dependences of heat capacity

Measurements of the temperature dependence of heat capacity (C_p) were carried out using a Netzsch differential scanning calorimeter, model STA 449 C. The heat capacity was calculated by comparison with a standard (single-crystal Al_2O_3). From Figure 1, it can be seen that for the $\text{SrFe}_{12}\text{O}_{19}$ sample, two thermal effects are observed. The exothermic effect is associated with the ferrimagnet–paramagnet transition (denoted as T_c). For the $\text{SrFe}_9\text{Ga}_3\text{O}_{19}$ and $\text{SrFe}_6\text{Ga}_6\text{O}_{19}$ samples, no thermal effect associated with the magnetic phase transition is observed; however, these samples are ferrimagnets and have Curie temperatures above room temperature (indicated by arrows in Figure). The nature of the second thermal effect (endothermic), observed for all samples except $\text{SrGa}_{12}\text{O}_{19}$, is unknown. It has been suggested that it is related to the redistribution of Fe^{3+} cations over crystallographic positions.

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