

Magnetic properties of $Mn_{1-x}Gd_xSe$ solid solutions

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The synthesis of polycrystalline $Mn_{1-x}Gd_xSe$ solid solutions is carried out by solid-state reaction method followed by quenching from the temperature of 1370 K. The X-ray diffraction studies realized at 300 K revealed that the structure of the single-phase samples in the $0 \leq x \leq 0,15$ concentration range is identified on base a face-centered cubic crystal cell of Fm $\bar{3}$ m space group. The heating of the solid solutions to ~ 900 K does not affect on the magnetic susceptibility as the dependence is identical to the measurements in the "heating-cooling" regime. Comparing the research results of magnetic properties of the $Mn_{1-x}Gd_xSe$ solid solutions with those of $Mn_{1-x}Gd_xS$ and $Mn_{1-x}Yb_xS$ [1,2] solid solutions, we can conclude that substitution of manganese ions by gadolinium in manganese selenide lead to smaller changes in the basic magnetic characteristics than in manganese sulfide.

References:

- [1] Solid State Physics, 2010, Vol.52, N.4., P.687-690.
- [2] Izvestia RAN, seria fizicheskaja, 2013. Vol.77, N.3. P. 2059-2062.