

The influence of Sm substitution on the electronic structure, magnetic and electric properties of GdIn₃ compound

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The effect of substitution of Sm for Gd atoms on the electrical resistivity, magnetic properties and the electronic structure of the GdIn₃ compound has been studied. All investigated Gd_{1-x}Sm_xIn₃ compounds crystallize in the cubic AuCu₃ type of crystal structure. The lattice parameter has increased with Sm concentration, but a deviation around $x=0.3$ from the Vegard's law was observed. A nonlinear change in the temperature of magnetic ordering T_N and the effective magnetic moment μ_{eff} versus concentration x has been noted. The electrical resistivity ρ versus temperature T strongly depends on the compositions. The electronic structure of all system was studied by using X-ray photoelectron spectroscopy (XPS). An increase of the intensity near the Fermi level for the compounds with $x > 0.3$ was observed. The results suggest the mixed-valence state of Sm atoms in the investigated compounds.

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