

Influence of yttrium substitution on the electronic structure and magnetic moment of $Gd_{7-x}Y_xPd_3$ ($x = 0, 1, 2, 3, 4$)

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Materials based on gadolinium are prospective for applications in magnetic refrigeration cycles. Recently the $Gd_5(Ge_{1-x}Si_x)_4$ alloys were widely examined [1]. The magnetic properties and temperature dependences of the lattice parameters of $Gd_{7-x}Y_xPd_3$ ($x = 0, 1, 2, 4$) single crystals have already been reported [2, 3]. These compounds crystallized in the same type of the crystal structure (Th_7Fe_3) with the same c/a ratio of 0.63. A strongly anisotropic behaviour of the magnetic and transport properties was found. The saturation magnetic moment per Gd ion is enhanced in relation to the theoretical value of free ion. Magnetic frustration and spin fluctuations on the palladium atoms are responsible for the complex magnetic properties of these ternary compounds. As a part of current research we present further characteristic of the $Gd_{7-x}Y_xPd_3$ single crystals. [1] K.A. Gschneidner Jr, V.K. Pecharsky, A.O. Tsokol, Rep. Prog. Phys. 68 (2005) 1479. [2] E. Talik, M. Klimczak, R. Troć, J. Kusz, W. Hofmeister, A. Winiarski, J. Alloys Compounds, in press. [3] E. Talik, M. Klimczak, A. Winiarski, R. Troć, J. Crystal Growth, in press.

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