TRANSPORT PROPERTIES OF THE $U_{1-x}Th_xPt$ SYSTEM

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9.7 cm

UPt was reported to crystallize in two distinct crystal structures with the orthorhombic CrB-[1] or the monoclinic PdBi-type [2]. Two magnetic transitions into a ferromagnetic state at 27 K [3] and 19 K [4] have also merged. We present the measurements of electrical resistivity ($\rho(T)$) and magnetoresistance (MR) on the solid solutions $U_{1-x}Th_xPt$, in which the parent compound UPt orders ferromagnetically below T_C = 21 K. The following points are noteworthy about our experimental results: (i) $\rho(T)$ of all the samples show typical spin-fluctuation behaviour with the AT^2-dependence in the ordered state. (ii) In agreement with magnetization and specific heat measurements [5], we observe a continuous suppression of the ferromagnetic ordering upon the Th-substitution.(iii) The MR of UPt is negative at low temperatures, reaching a high value of -22 % at T_C and B = 8 T. (iv) The value of MR increases with x and becomes positive for Th-rich compositions. We discuss these results in the framework of existing models.

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[2] A. Dommann and F. Hulliger, Solid State Comun. 65 (1988) 1093.
[3] J.G. Huber, M.B. Maple and D. Wohlleben, J. Magn. Magn. Mater. 1 (1975) 58.
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