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Crystal growth and some transport properties of REM_3 intermetallics $M = Sn, In$

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Crystal growth and some transport properties of REM_3 intermetallics $M = Sn, In$ will be discussed.

Results of the electrical resistivity and the thermoelectric power measurements done on monocrystalline samples of $RESn_3$ compounds ($RE = La, Pr, Nd, \text{ and } Gd$) are presented for the temperature range 5.5—300 K. It was found that TEP is positive and weakly temperature dependent at temperatures $T > 100$ K, for $T < 100$ K pronounced anomalies have been observed for the $PrSn_3$ and the $NdSn_3$ compounds in the vicinity of 10 K. We argue that these anomalies are caused by the Kondo and crystal field effects, respectively. For the dense Kondo compound $PrSn_3$, the anomalous behaviour of the TEP is very similar to that found for the electrical resistivity plot. The TEP and the electrical resistivity exhibit $\log T$ dependence in temperatures $10 \text{ K} < T < 30$ K and both show very similar dramatic decrease below $T_N = 8.6$ K. This decrease, in case of the TEP, leads to a sign reverse at 7.5 K and a TEP minimum at 6 K. Although the $\log T$ dependence of the TEP found for $T > 10$ K is probably accidental, because to our knowledge no theoretical models give such a simple temperature dependence of the TEP in Kondo systems, nevertheless we are convinced that the antiferromagnetic ordering taking place at $T_N = 8.6$ K plays a crucial role in a modification of scattering mechanisms influencing both the TEP and the electrical resistivity of $PrSn_3$.