INTERACTION BETWEEN TLS AND CONDUCTION ELECTRONS IN ACTINIDE ARSENOSELENIDES

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9.7 cm

In spite of strong ferromagnetism of UAsSe (T_C=113 K), its uncommon low-T properties i.e., a pronounced upturn in the electrical resistivity $\rho(T)$, are certainly of non-magnetic origin. ^{77}Se NMR studies performed on powdered UAsSe clearly pointed to a crystallographic misplacement in the anionic sublattice. This gave additional evidence of interaction between the conduction electrons and the two-level-system (TLS) centers. A qualitatively similar $\rho(T)$ behavior has also been observed in diamagnetic ThAsSe.
We report $\rho(T, p \leq 1.8\text{GPa})$ results obtained on UAsSe and ThAsSe single crystals in the temperature range 1.5 - 300 K. Although a high hydrostatic pressure was applied, only a small reduction in the $\rho(T, p{=}0)$ upturn was observed. Moreover, the pressure did not affect the temperature at which the upturn starts to develop. Both facts fit well with the theoretical prediction of the non-magnetic TLS Kondo model. Discussion will be extended to the thermodynamic properties of actinide arsenoselenides.

13.4 cm

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