9.7 cm

ELECTRON TRANSPORT AND POINT CONTACT SPECTROSCOPY OF CUBIC $DyCu_5$

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The electron transport properties and point contact spectra of the cubic phase (structure type $AuBe_5$, space group F-43m) of melt-spun $DyCu_5$ have been investigated. In ac-susceptibility and magnetization measurements, it has been found that below a transition temperature T_m=6.5 K this phase is metamagnetic. The samples show a spontaneous magnetization between T_m and T_C=14.5 K. These magnetic phenomena imply also uncommon electron transport effects. Our measurements of electrical resistivity confirm the existence of two magnetic phase transitions in the compound. This magnetic behavior is attributed to RKKY-type indirect exchange interactions. Further, we present point contact spectra of $DyCu_5$ - Cu heterocontacts which are directly proportional to the electron-quasiparticle interaction function. Apart of a peak at about 18 meV, which is characteristic for electron-phonon interaction in pure Cu, we have observed a series of additional maxima at lower energy, which are connected with the allowed $4f$-transitions from the ground state to excited crystalline electric field levels.

13.4 cm

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