BREAKDOWN DE GENNES SCALING IN $Y_{1-x}Dy_xNi_2B_2C$ SINGLE CRYSTALS

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9.7 cm

Single crystals of $Y_{1-x}Dy_xNi_2B_2C$ ($1\leq x \leq 0.7$) were grown using arc- melting method. Quality of the crystal was examined by X-ray diffraction and stoichiometry was attested by XPS measurements using electron spectometer PHI 5700/660. Magnetic measurements were carried out with a SQUID magnetometer at the temperature range 1.8 - 300 K in the applied field up 5 T. The superconducting transition temperatures (T_c) and Néel temperatures (T_N) were determined for investigated samples. Dramatic depressing of superconductivity observed in lightly Y substituted $DyNi_2B_2C$ leads to a breakdown of the Gennes scaling for $T_c\langle=T_N$. Interactions between the rare earth ions and the conduction electrons seem to be very sensitive to the stoichiometry of the constituents.

13.4 cm

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