MAGNETIC PROPERTIES AND MAGNETORESISTANCE OF THE $DyMnB_4$

E.M. Levin[1,3], T. Palewski[1], T. Mydlarz[1], B.S. Kuzhel[2], Yu.B. Kuz'ma[2] and S.I. Miklashenko[2]

[1]International Laboratory of High Magnetic Fields and Low Temperature, 95 Gajowicka Str., 53-421 Wroclaw, Poland.
[2]Lviv State University, 1 Universitets'ka Str., Lviv, 290602 Ukraine
[3]Ames laboratory, Iowa State University, Ames, IA, 50011, USA

9.7 cm

The magnetization of the $DyMnB_4$ compound at 4.2 K in a magnetic field up to 13 T shows the presence of two nonlinear parts, one in magnetic field up to 4 T, and second between 4 and 13 T. Magnetization at 4.2 K in a field 13 T is equal 130 emu/g what is correspond to 6.7 μ_B/FU. In the temperature range 80...200 K temperature dependence of susceptibility is following C-W law with Θ = 30 K and effective magnetic moment p_{eff}= 7.5 μ_B what is significantly less than the theoretical value of 10.65 μ_B for Dy^{3+} ion. The temperature dependence of the resistance in a magnetic field shows a large magnetic contribution below 20 K and Kondo-like behaviour. The magnetoresistance (MR=$[\rho(H,T)$-$\rho(0,T)]/\rho(0,T)$) is about few percent but below 20 K increases very strongly and reaches value of 300 % at 4.2 K. A large MR for the intermetallic compound of rare-earth and transition metal is rather unusual and very probably is due to a presence of ferromagnetic order in this compound.

13.4 cm

Subject category :

4. Rare Earths and Actinides, Alloys and Compounds

Presentation mode :
poster

Corresponding author :
Tomasz Palewski

Address for correspondence :
International Laboratory of High Magnetic Fields and Low Temperature,
95 Gajowicka Str., 53-421 Wroclaw, Poland.

Email address :
paltom@alpha.mlspmint.pan.wroc.pl