

Electrical properties of carbon doped EuB_6

M. Baťková^a, I. Baťko^a, M. Mihalik^a, E.S. Konovalova^b, N. Shitsevalova^b
and Y. Paderno^b

^aInstitute of Experimental Physics, SAS, SK-04353 Košice, Slovakia

^bInstitute for Problems of Material Science, NASU, UA-252680 Kiev, Ukraine

EuB₆ is ferromagnetic below 16 K and its low-temperature properties show remarkable similarities to those of manganese oxides, exhibiting the phenomenon of colossal magnetoresistance [1]. Substitution of boron by carbon brings electrons into the conduction band of EuB₆, thus EuB_{6-x}C_x carbide borides behave as degenerate semiconductors in which both carrier concentration and antiferromagnetic interaction increase with increasing of carbon content. Our former results of electrical resistivity measurements of the sample (with x close to 0.05) show the high (residual) resistivity at lowest temperatures while measurements of the magnetic field dependence of electrical resistivity at 4.2 K indicate a giant magnetoresistance, as the ratio between the resistivity in zero magnetic field and in the field of 3 T has been 3.7 [2]. In this work, we present careful measurements of the electrical resistivity and the electron tunneling spectroscopy studies. On the basis of obtained results, conclusions on the nature of the magnetic scattering of charge carriers in the vicinity of the magnetic phase transition and conclusions on the density of electronic states of the studied system have been done.

1. H.R.Ott et al., *Physica B* **281&282** (2000) 423-427

2. I. Baťko et al., *Solid State Commun.* **98** (1996) 895

13.4 cm

Subject category :

4. Rare Earths and Actinides, Alloys and Compounds

Presentation mode :

poster

Corresponding author :

I. Baťko

Address for correspondence :

Institute of Experimental Physics SAS

Watsonova 47

043 53 Košice

Email address :

batko@saske.sk

9.7 cm