

Enormous anisotropy of the Hall effect and magnetoresistivity in URhGe ferromagnet

W.Miiller^a, V.H.Tran^a, N.Oeschler^b and F.Steglich^b

^aInstitute of Low Temperature and Structure Research, Polish Academy of Sciences,
ul. Okólna 2, 50-422 Wrocław, Poland

^bMax-Planck-Institut für Chemische Physik fester Stoffe, Nöthnitzer Str. 40, 01187
Dresden, Germany

The orthorhombic URhGe is well known as intermetallic compound showing the co-existence of ferromagnetism ($T_c=9.5$ K) and superconductivity ($T_{sc}=0.25$ K). In this contribution, we report the measurements of the Hall effect R_H and magnetoresistance MR in a single crystalline sample of URhGe, grown by Czochralski method. The data obtained in the temperature range 2-300 K and magnetic fields up to $\mu_0 H = 5.5$ T from two configurations ($J//a, \mu_0 H//c$) and ($J//c, \mu_0 H//b$) revealed very large anisotropy. For the first configuration, the Hall coefficient is positive in the whole temperature range studied. R_H reaches a pronounced maximum at 18.5 K with a value of $41.3 \times 10^{-9} \text{ m}^3/\text{C}$. MR , however, is negative with a minimum at T_C . A more complex behaviour of $R_H(T)$ was found for the second configuration. The Hall coefficient is positive down to 35 K, where it changes to negative values, attaining a minimum near T_C . At this temperature R_H amounts to $-2.28 \times 10^{-9} \text{ m}^3/\text{C}$. Magnetoresistivity below 7 K is positive and reveals a complex field dependence. The presented data indicate a complexity and anisotropy of the band structure and scattering mechanisms in URhGe.

9.7 cm

13.4 cm

Subject category :

1. Strongly Correlated Electrons and High Temperature Superconductivity

Presentation mode :

poster

Corresponding author :

W.Miiller

Address for correspondence :

W.Miiller, Institute of Low Temperature and Structure Research, Polish Academy of Sciences, ul. Okólna 2, 50-422 Wrocław, Poland

Email address :

w.miiller@int.pan.wroc.pl