

Heat capacity of heavy fermion compound CeCu₄Ga in high magnetic fields

A. Kowalczyk^a, T. Toliński^a, M. Reiffers^b, M. Zapotoková^b, M. Falkowski^a
and E. Gažo^b

^aInstitute of Molecular Physics, PAS, Smoluchowskiego 17, 60-179 Poznań, Poland

^bInstitute of Experimental Physics, SAS, Watsonova 47, 043 53 Košice, Slovakia

The heat capacity in the applied magnetic field up to 9 T, susceptibility and magnetization of polycrystalline CeCu₄Ga are presented. Magnetic ordering was not observed down to 2 K. For temperature $T < 200$ K a Curie-Weiss behavior is observed giving an effective magnetic moment $\mu_{\text{eff}} = 2.53\mu_{\text{B}}/\text{f.u.}$ The experimental value of μ_{eff} is close to the calculated one for a free Ce³⁺ ion $\mu_{\text{eff}} = g(j(j+1))^{1/2} = 2.54\mu_{\text{B}}$, thus indicating the presence of well localized magnetic moments carried by the stable Ce³⁺ ions. At low temperatures the electronic heat capacity coefficient γ value depends strongly on the temperature range used for the extrapolation and applied magnetic field. We observe a typical heavy fermion behavior with γ value of about $380 \text{ mJmol}^{-1}\text{K}^{-2}$ obtained from extrapolation to $T = 0$ K of the temperature range above 4 K. However, extrapolation of the lowest temperatures range yields the γ value of $1.1 \text{ Jmol}^{-1}\text{K}^{-2}$. The observed behavior is in a qualitative agreement with Refs. [1,2]. The effects of magnetic field on low-temperature heat capacity of CeCu₄Ga are presented.

[1] E. Bauer et al., J. Magn. Magn. Mat. 69 (1987) 158

[2] E. Bauer et al., Solid State Commun. 63 (1987) 271

13.4 cm

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Corresponding author :

A. Kowalczyk

Address for correspondence :

Institute of Molecular Physics
Polish Academy of Sciences
Smoluchowskiego 17
60-179 Poznań
Poland

Email address :

ankow@ifmpan.poznan.pl

9.7 cm