

Spin-gap phase in superconductor Mo₃Sb₇: A specific heat study

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Several years ago, Bukowski and coworkers reported the superconductivity in an intermetallic Mo₃Sb₇ [1]. Although with rather low T_C of 2.1 K the material is interesting in many aspects. According to the recent report, Mo₃Sb₇ is a spin fluctuation superconductor [2]. Very recently, we have measured low-temperature specific heat on a polycrystalline sample and found a large Sommerfeld coefficient, which has been attributed to a narrow Mo-4d band pinned at the Fermi level. Furthermore, the electronic specific heat in the superconducting state has been ascribed to the presence of two BCS-like gaps with $2\Delta_1 = 4.0k_B T_c$ and $2\Delta_2 = 2.5k_B T_c$ [3]. In this contribution, we report measurements of high-temperature specific heat for Mo₃Sb₇ and for phonon reference Ir₃Ga₃Ge₄. As the measurements revealed Mo₃Sb₇ exhibits a pronounced maximum around 50 K, for which the behavior may be interpreted as the opening of a spin gap [4], thus resembling very much the situation found in high-temperature superconductors.

References

1. Z. Bukowski et al., Solid State Commun. 123, 283 (2002)
2. C. Candolfi et al. Phys. Rev. Lett. 99, 037006 (2007)
3. V. H. Tran, et al., submitted to Acta materialia (2008)
4. V. H. Tran, et al., Phys. Rev. Lett. 100, 14xxxx, (2008).

13.4 cm

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Presentation mode :

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9.7 cm