9.7 cm

μSR STUDY ON $CeRh_2Si_2$

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$CeRh_2Si_2$ has two magnetic transition temperatures, T_{N1} and T_{N2}. Using the μSR technique we found the suppression - by the applied pressure - of the magnetic transition temperatures, in agreement with results obtained in macroscopic measurements [GR97]. However, the magnetic structure proposed from neutron scattering under pressure measurements [KA00], are at variance with our μSR results both below T_{N1} and T_{N2}. At temperatures between T_{N1} and T_{N2} the origin of one of the two contributions to the μSR signal cannot be explained by the proposed magnetic structure. Below T_{N2} our results point to a double domain magnetic structure, in contrast with the single domain 4-k magnetic structure proposed in [KA00]. Moreover, according to the neutron scattering results the ordered moment decreases with increasing pressure, while the μSR results reveal a pressure independent ordered moment, at least up to 5 kbar. These results indicate a well localized $4f$ moment for the Ce ions, in the low pressure range, in agreement with the large magnetic transition temperature of $CeRh_2Si_2$, $T_{N1} = 36$ K. The magnetic structure of $CeRh_2Si_2$ remains a subject of debate.

[GR97] F. M. Grosche et al., Physica B 237-238 (1997) 197.

[KA00] S. Kawarazaki, et al, Phys. Rev. B 61 (2000) 4167.

13.4 cm

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