The effect of dilution on the ferromagnetic ordering of CeAuGe

B.M. Sondezi[1] and A.M. Strydom[1]

[1] *Physics Department, University of Johannesburg, P.O. Box 524, Auckland Park, 2006, South Africa*

Transport and thermodynamic properties of the well-ordered hexagonal ferromagnetic CeAuGe compound have been studied. The ferromagnetic ordering anomaly is shown in $\chi(T)$, $\rho(T)$ and $C_{\rm p}(T)$ at $T_{\rm C} = 10$ K. The location of $T_{\rm C}$ has been observed to be unstable and enhanced even in moderate applied magnetic fields. However, the dilution of magnetic species, Ce, with the non-f electron element, La, is shown in this work to achieve a continous suppression of $T_{\rm C}$ to 0 K. The integrity of the space group and the details of the unit cell occupation are retained throughout the substitution series, as is the high-temperature localized Ce-effective moment $\mu_{\rm eff} = 2.54\ \mu_{\rm B}$. Our studies of physical properties down to 50 mK show a quantum critical form of non-Fermi liquid behaviour, characterised by a logarithmic divergence in $C_{\rm p}(T)/T$ data in the very dilute Ce limit close to the putative quantum phase transition.