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Size effects on superconductivity and Kondo behavior in CeCo₂

Y.Y. CHEN, Institute of Physics, Academia Sinica, Taipei, Taiwan, ROC, M.N. OU, B.J. CHEN, C.B. TSAI, S.J. TSAI — Size effects on superconductivity and Kondo behavior were studied on a series of CeCo₂ nanoparticles (5.8-24 nm) by heat capacity measurements at T=0.4-30 K and H=0-8 T. In contrast to bulk CeCo₂ superconductor ($T_C \sim 1.3$ K), no superconductivity instead an enhancement of Kondo anomaly with $T_K = 1.6-8.8$ K was revealed. Anderson's criterion can't explain the results, especially for $d \geq 11$ nm. To answer the problem the competition between Kondo interactions and superconductivity was proposed. In addition, the size dependence of T_K and its correlation with lattice constant were observed.

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