Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Disorder and size effects in Kondo lattice nanoparticles YANG-YUAN CHEN, P. H. HUANG, M. N. OU, Institute of Physics, Academia Sinica, Taipei, Taiwan 115 ROC, J. M. LAWRENCE, Department of Physics and Astronomy, University of California, Irvine, CA92717 USA, C.H. BOOTH, Chemical Sciences Division, Lawrence Berkeley National Laboratory, Berkeley, CA 94720-8175 USA — The evolution of Kondo interactions and magnetic order with size variation was revealed by the specific heat and magnetic susceptibility in a series of $CePt_2$ Kondo lattice nanoparticles with various sizes. In addition to the magnetic order suppression with size reduction, two regimes of size dependence of Kondo temperature T_K was observed. As size d decreases from the bulk down to 22 nm firstly T_K slightly decreases from 4.6 K to 3.7 K, as d further decreases, inversely T_K increases up to 100 K for size d=3.8 nm. It is confirmed that the size-induced lattice disorders are responsible for the result for d $\geq$ 22 nm, while the rapid increase of T_K for d =3.8 nm is attributed to the lattice contraction and quantum size effects.

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Date submitted: 13 Dec 2005 Electronic form version 1.4