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Stability of the Kondo Lattice and Field-tuned Antiferromagnetic Structures in the $Ce_{1-x}Yb_xRhIn_5$ System[1] SOOYOUNG JANG, BENJAMIN WHITE, MARC JANOSCHEK, BRIAN MAPLE, University of California, San Diego — We have investigated the series $Ce_{1-x}Yb_xRhIn_5$ ($0 \leq x \leq 0.8$) by means of x-ray diffraction, energy dispersive x-ray spectroscopy, electrical resistivity (ρ), specific heat (C), and magnetic susceptibility measurements. The coherence temperature T_{coh} inferred from $\rho(T)$ remains nearly constant over a wide range of Yb concentrations $0 \leq x \leq 0.8$. Measurements of $C(T)$ were made in various magnetic fields up to 9 tesla on the $Ce_{1-x}Yb_xRhIn_5$ samples. In $CeRhIn_5$, the peak in $C(T)$ associated with the incommensurate antiferromagnetic (AFM) transition is accompanied by another peak that is associated with the commensurate AFM transition that emerges in an applied magnetic fields. Measurements on $Ce_{1-x}Yb_xRhIn_5$ samples ($x = 0$, 0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.8) reveal that the field induced commensurate AFM peak shifts relative to the incommensurate peak with Yb substitution. The results indicate that Yb substitution stabilizes the electronic state and tunes the AFM structures in $Ce_{1-x}Yb_xRhIn_5$.

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