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Tuning the Kondo effect in $YbFe_{1-x}Co_xZn_{20}$[1] TAI KONG, VALENTIN TAUFOUR, SERGEY BUD'KO, PAUL CANFIELD, Ames Laboratory / Iowa State Univeristy — $YbCo_2Zn_{20}$ is a heavy fermion compound with a Sommerfeld coefficient, γ value, of about 8000 mJ/mol-K^2 with an estimated single ion Kondo temperature, T_K, of about 1.5 K. One the other hand, $YbFe_2Zn_{20}$ is less heavy with $\gamma \sim 500$ mJ/mol-K^2 and $T_K \sim 30$ K. From a generalized Kadowaki-Woods picture, degeneracies that relate to their Kondo phenomena are large while different: 8 for $YbFe_2Zn_{20}$ and 4 for $YbCo_2Zn_{20}$ [1]. In order to understand the effects of Fe-Co substitution on the Kondo effect, a family of $YbFe_{1-x}Co_xZn_{20}$ were studied. We performed zero-field resistivity and specific heat measurements on single crystals of $YbFe_{1-x}Co_xZn_{20}$ that were synthesized using a high-temperature solution growth technique [2]. The Kondo characteristic temperatures do not change monotonically in between pure $YbFe_2Zn_{20}$ and $YbCo_2Zn_{20}$. Data and a summarize phase diagram of characteristic temperatures as a function of Co doping will be presented and discussed.

[1] M. S. Torikachvili et al. Proc. Natl. Acad. Sci. USA 104, 9960 (2007)
[2] S. Jia et al. Nat. Phys. 3, 334 (2007)

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