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From Kondo behavior to high temperature superconductivity in $\text{Sr}(\text{Ni}_{1-x}\text{Fe}_x)_2\text{As}_2$ NICHOLAS WAKEHAM, Los Alamos National Laboratory, NI NI, UCLA, Department of Physics and Astronomy, ERIC BAUER, JOE THOMPSON, FILIP RONNING, Los Alamos National Laboratory — SrFe_2As_2 has an antiferromagnetic groundstate at ambient pressure that can be suppressed by chemical doping or pressure to produce unconventional superconductivity. SrNi_2As_2 is a non-magnetic conventional superconductor with T_c of 0.6 K. It has been shown that in $\text{Sr}(\text{Ni}_{1-x}\text{Fe}_x)_2\text{As}_2$ there is a dome of superconductivity between $x = 0.95$ and $x = 0.9$. However, little is known about this doping series for small x values. We will present the study of the thermodynamic and transport properties of the doping series of $\text{Sr}(\text{Ni}_{(1-x)}\text{Fe}_x)_2\text{As}_2$ for $x \leq 0.6$. In the dilute Fe limit ($x \leq 0.01$) we find strong evidence for single-ion Kondo behaviour. As the concentration of Fe is increased, Fe-Fe interaction effects become significant and the Kondo scale increases. For $0.2 \leq x \leq 0.6$ magnetic susceptibility measurements show the presence of a spin glass transition. The presence of Kondo behaviour in $\text{Sr}(\text{Ni}_{(1-x)}\text{Fe}_x)_2\text{As}_2$ indicates the formation of local moments interacting with conduction electrons. Therefore, we will address the relevance of this result to the discussion of the itineracy of the magnetism in SrFe_2As_2 , as well as the observed enhancement of the effective mass seen in many pnictide compounds.

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