Phase Transitions in CuAs-based $K_xSr_{1-x}Cu_4As_2$ System

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Inspired by the superconductivity with a $T_c \sim 3.5$ K reported by Han et al. in Cu-based $LiCu_2P_2$, the Cu-based compound $SrCu_4As_2$ which has a more complex CuAs layers structure sandwiched by Sr layers, was synthesized and characterized. The magnetoresistance measurements show two anomalies around $\sim 140$K and $\sim 60$K, respectively, which is also consistent with the results of specific heat measurement. Systematically studies of K-doping into $SrCu_4As_2$ system are carefully investigated at ambient and high pressures and no superconductivity has been found in the $K_xSr_{1-x}Cu_4As_2$ system down to 2K, although superconductivity might occur at lower temperature in this system. The overall pressure and doping effects on the magnetic and transport properties of the compounds will be presented and discussed.

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