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Doping dependence of structural transitions in $LaCu_{6-x}Ag_x$ L. POUDEL, Univ. of Tennessee, Knoxville and Oak Ridge National Laboratory, M. KOEHLER, Univ. of Tennessee, Knoxville, M. MCGUIRE, Oak Ridge National Laboratory, V. KEPPENS, Univ. of Tennessee, Knoxville, C. DELA CRUZ, Oak Ridge National Laboratory, D. MANDRUS, Univ. of Tennessee, Knoxville and Oak Ridge National Laboratory, A. CHRISTIANSON, Oak Ridge National Laboratory
— $CeCu_{6-x}Au_x$ is a well known heavy fermion system that exhibits a quantum critical point (QCP) at x $\simeq$ 0.1. One interesting feature of the $CeCu_{6-x}Au_x$ system is the doping dependence of the structural phase transition. The end member $CeCu_6$ undergoes a structural transition from an orthorhombic to a monoclinic phase at 230 K. The transition temperatures drop linearly with Au concentration until the transition is suppressed at x $\simeq$ 0.1. This is the same composition where the antiferromagnetic quantum critical point occurs. We study the related system, $LaCu_{6-x}Ag_x$, in order to determine the behavior of structural transition as is it suppressed without the complicating influence of magnetism. In analogy with the $CeCu_{6-x}Au_x$ system, $LaCu_6$ displays a structural transition from an orthorhombic to a monoclinic phase at 460 K, which is suppressed by Ag doping. The suppression of the transition temperature occurs in conjunction with an expansion on of the lattice. Both the transition temperature and the monoclinic order parameter $(acCos\beta)^2$ scale linearly with Ag doping. Extrapolation of either the transition temperature or the monoclinic order parameter indicates that the structural transition is suppressed completely for x $\simeq$0.225

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