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Physical and magnetic properties of $LaFe_{0.6}Sb_2$[1] JENNIFER MISURACA, J.E. GROSE, J.W. SIMONSON, C. MARQUES, J. LIU, G. SMITH, A. PURI, J. HASSINGER, Department of Physics and Astronomy, Stony Brook University, M.C. ARONSON, Department of Physics and Astronomy, Stony Brook University and Condensed Matter Physics and Materials Science, Brookhaven National Laboratory — Currently, there is a tremendous effort to grow and characterize new iron pnictide materials with the hopes of discovering the next set of novel high temperature superconductors. The previous research has been focused on iron phosphides and arsenides, with relatively little work being done on the next heavier pnictogen, antimony. In this work, single crystals of the layered iron pnictide $LaFe_{0.6}Sb_2$ have been grown with the $ZrCuSi_2$ structure with vacancies on the Fe sites as determined via x-ray diffraction and energy-dispersive x-ray spectroscopy. The DC magnetization, resistivity, and heat capacity have been measured in a range of temperatures between 300 K and 0.5 K. The susceptibility is small and shows very little anisotropy; there is a maximum at 265 K and we see no Curie-Weiss-like behavior from room temperature down to 1.8 K. This material is a good metal whose resistivity decreases by a factor of 1.4 from 300 K to 0.5 K and we see Fermi liquid-like behavior from 7 K to 20 K. Although there is no evidence of bulk superconductivity down to 0.5 K in this undoped material, a large Sommerfeld coefficient of 50 mJ/(mol Fe) K^2 suggests that this metal is very strongly correlated.

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