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High-temperature weak ferromagnetism on the verge of a metallic state: Impact of dilute Sr doping on BaIrO3 ESMAT ELHAMI, GANG CAO, XINU LIN, SHALINEE CHIKARA, VINOBALAN DURAIRAJ, University of Kentucky — The 5d-electron-based $BaIrO_3$is a nonmetalic weak ferromagnet with a Curie temperature at T_C= 175 K. Its greatly extended orbitals generate strong electron-lattice coupling, and the magnetism and electronic structure are thus critically linked to the lattice degree of freedom. Here we report results of our transport and magnetic study on slightly Sr-doped $BaIrO_3$. It is found that dilute Sr doping drastically suppresses T_C, and instantaneously leads to a nonmetal-metal transition at high temperatures. All results highlight the instability of the ground state and the subtle relation between magnetic ordering and electron mobility. It is clear that $BaIrO_3$ along with very few other systems represent a class of materials where the magnetic and transport properties can effectively be tuned by slight alterations in lattice parameters.

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