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# Iridium double perovskite Sr2YIrO6: A combined structural and specific heat study

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## Abstract

© 2017 American Physical Society. Recently, the iridate double perovskite Sr2YIrO6 has attracted considerable attention due to the report of unexpected magnetism in this Ir5+ (5d4) material, in which according to the Jeff model, a nonmagnetic ground state is expected. However, in recent works on polycrystalline samples of the series Ba2-xSrxYIrO6 no indication of magnetic transitions have been found. We present a structural, magnetic, and thermodynamic characterization of Sr2YIrO6 single crystals, with emphasis on the temperature and magnetic field dependence of the specific heat. As determined by x-ray diffraction, the Sr2YIrO6 single crystals have a cubic structure, with space group Fm3m. In agreement with the expected nonmagnetic ground state of Ir5+ (5d4) in Sr2YIrO6, no magnetic transition is observed down to 430 mK. Moreover, our results suggest that the low-temperature anomaly observed in the specific heat is not related to the onset of long-range magnetic order. Instead, it is identified as a Schottky anomaly caused by paramagnetic impurities present in the sample, of the order of n~0.5(2)%. These impurities lead to non-negligible spin correlations, which nonetheless, are not associated with long-range magnetic ordering.

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