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Influence of cation and oxygen vacancy ordering on magnetic properties of $RE_{1-x}Sr_xCoO_{3-\delta}$ (RE=Ho, La) S. KOLESNIK, B. DABROWSKI, O. CHMAISSEM, J. MAIS, Department of Physics, Northern Illinois University, DeKalb, IL 60115, Materials Science Division, Argonne National Laboratory, Argonne, IL 60439, A. BASZCZUK, Institute of Materials Science and Applied Mechanics, Wroclaw University of Technology, 50-370 Wroclaw, Poland — The attractive physical properties of $RE_{1-x}Sr_xCoO_y$ (RE - rare earth and Y) are strongly dependent upon overall oxygen content y and the ordering of oxygen and RE/Sr, as well as charge and spin ordering on the Co^{3+}/Co^{4+}- sites. Structural, magnetic and thermoelectric properties of $Ho_{1/3}Sr_{2/3}CoO_y$ have been studied within the oxygen content range 2.67<y<2.80. The studied samples demonstrate antiferromagnetic order (G-type) and semiconductive behavior. No ferromagnetic ordering has been observed and compared with A. Maignan et al. on a closely related $Sr_{2/3}Y_{1/3}CoO_y$ with similar y. We have observed that a the same high degree of oxygen ordering and antiferromagnetic structure exists for both cation disordered (La) and ordered (Y,Ho) materials. We conclude that the high degree of oxygen vacancy ordering determines the observed properties via strong localization of Co^{3+}electrons. Work at NIU was supported by the NSF-DMR-0302617 and at ANL by the U.S. DOE under contract No. DE-AC02-06CH11357.

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