Abstract Submitted
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Ba_2CoO_4: Crystal Growth, Structure Refinement, and Physical Properties[1] RONGYING JIN, Oak Ridge National Laboratory, HAO SHA, Florida International University, PETER KHALIFAH, Oak Ridge National Laboratory and University of Massachusetts, RICHARD SYKORA, BRIAN SALES, DAVID MANDRUS, Oak Ridge National Laboratory, JIANDI ZHANG, Florida International University — Single crystalline Ba_2CoO_4 is grown for the first time using the floating-zone technique. Single-crystal refinement of X-ray diffraction data indicates that Ba_2CoO_4 has a monoclinic structure with a = 5.9176(13) Å, b = 7.6192(16) Å, c = 10.3790(22) Å, and ß = 91.734(4)^o at room temperature. Magnetic susceptibility, specific heat, and thermal conductivity show anomalies at T_N = 25 K, due to antiferromagnetic ordering. However, the magnitude of the Néel temperature T_N is significantly lower than the Curie-Weiss temperature ($|\Theta| \sim 110$ K), suggesting either reduced-dimensional magnetic interactions and/or the existence of magnetic frustration. The latter may be induced by disorder evident from the variable-range-hopping behavior in electrical resistivity, non-zero T term in specific heat and T^2 dependence in thermal conductivity at low temperatures.

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