

## Reversible Magnetization of Co Doped BaFe<sub>2</sub>As<sub>2</sub>

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We present reversible magnetization measurements for applied fields in the range from 0.1 Tesla to 7 Tesla while varying the temperature for optimally doped BaFe<sub>1.8</sub>Co<sub>0.2</sub>As<sub>2</sub> single crystals with  $T_c=23.6$  K. The rounding fluctuating magnetization was observed in the reversible range of magnetization for temperatures above 18 K. This fluctuation effect is quite small compared to that in high-temperature cuprate superconductors, but is still large enough to obtain the essence of the physical properties in this iron-pnictide superconductor. This reversible magnetic fluctuation follows a three-dimensional scaling form in the critical fluctuation region for fields above 1 Tesla, which indicates that this iron-pnictide superconductor belongs to the class of three-dimensional superconductors

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