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Enhanced thermopower and ferromagnetic fluctuations in Sc-substituted CaRuO₃: An experimental study of the Kelvin formula
TAKAFUMI D. YAMAMOTO, RYO YATAGAI, KENJI TANABE, Nagoya University, RYUJI OKAZAKI, Tokyo University of Science, HIROKI TANIGUCHI, Nagoya University, YUKIO YASUI, Meiji University, SATOSHI IGUCHI, TAKAHIKO SASAKI, IMR, Tohoku University, ICHIRO TERASAKI, Nagoya University — We report both thermoelectric and thermodynamic properties of a non-uniform magnetic system CaRu_{0.8}Sc_{0.2}O₃, in which a ferromagnetic component induced by Sc³⁺ is embedded in a paramagnetic component of CaRuO₃ [T. D. Yamamoto *et al.*, *J. Phys. Soc. Jpn.* **84**, 014708 (2015); **85**, 034711 (2016)]. Our thermoelectric measurement shows that the thermopower is significantly suppressed by a magnetic field at around a quasi-ferromagnetic transition temperature of 30 K, below which ferromagnetic clusters start to be formed. Furthermore, negative magnetic entropy change takes a maximum in the same temperature range, indicating the suppression of ferromagnetic fluctuations. We discuss the relationship of the thermopower to the spin entropy in this material based on the Kelvin formula, which has been used as a good approximate expression for strongly correlated materials.

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