

Experimental Study of Magnetocaloric Effect in the Two-Dimensional Quantum System $\text{Cu(en)(H}_2\text{O)}_2\text{SO}_4$

R. Tarasenko, L. Sedláková, A. Orendáčová, M. Orendáč, and A. Feher

Centre of Low Temperature Physics of P.J. Šafárik University and SAS, Park Angelinum 9, SK-041 54 Košice, Slovak Republic

Magnetocaloric study have been performed on a two-dimensional (2D) quantum system $\text{Cu(en)(H}_2\text{O)}_2\text{SO}_4$ (en=ethylenediamine= $\text{C}_2\text{N}_2\text{H}_8$) in the temperature range from 0.4 K to 4 K in magnetic fields up to 2 T by adiabatic magnetization and adiabatic demagnetization measurements. The title compound has been previously identified as a potential realization of the quasi-two dimensional spatially anisotropic triangular Heisenberg antiferromagnet with spin 1/2 and effective intralayer exchange coupling, $J/k_B = -1.4$ K. A phase transition to magnetically ordered state has been observed in zero magnetic field at $T_N = 0.91$ K¹. The normal magnetocaloric effect (MCE) was observed in the temperature range from 0.62 K to 0.98 K. In contrast, at temperatures near the phase transition the character of MCE changes to inverse. Above temperature 2 K the normal MCE was observed again. This change can be ascribed to the onset of short-range magnetic correlations previously observed in specific heat and susceptibility studies.

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¹M. Kajňaková, M. Orendáč, A. Orendáčová, A. Vlček, J. Černák *et al.*, Phys. Rev. B. **71**, 014435 (2005).