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Specific heat measurements in the novel frustrated quantum magnets $SrHo_2O_4$ and $SrDy_2O_4$ A. D. BIANCHI, B. PREVOST, U. de Montreal, QC, Montreal, Canada, N. KURITA, F. RONNING, R. MOVSHOVICH, T. W. KLIMCZUK, LANL, Los Alamas, NM, USA, M. KENZELMANN, LDM, PSI, Villigen, Switzerland, R. J. CAVA, Princeton University, Princeton, NJ, USA — We investigated the specific heat of the novel geometrically frustrated quantum magnets $SrHo_2O_4$ and $SrDy_2O_4$ to determine the nature of their ground states. We present a study of the magnetic field dependence of specific heat $C_p(T, H)$ measured in a dilution refrigerator between 0.1 K and 4 K and a PPMS between 2 and 50 K for magnetic fields H between 0 and 9 T. We subtracted the phonon background $C_{\rm ph}$ by using a temperature dependent Debye temperature determined from measurements on the non-magnetic structural analogue $SrLu_2O_4$. After this subtraction, in $SrHo_2O_4$ we observed a broad anomaly in the magnetic specific heat $C_{\rm mag} = C_p - C_{\rm ph}$ centered at 0.5 K in zero field. At high fields, we found a broad peak centered at 0.35 K which decreases with rising magnetic field. $SrDy_2O_4$ in zero field has a broad anomaly at 1.2 K. The peak broadens with increasing H and its amplitude decreases, and by 5 T it is completely suppressed. By 50 K, each ion in the Dy compound has recovered 21.5 J/mol K of its spin entropy, which is comparable to the entire spin entropy of a free Dy ion of $R \cdot ln(2J+1)$, whereas we observe only 11.1 J/mol K for $SrHo_2O_4$.

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