Specific heat measurements in the novel frustrated quantum magnets \( \text{SrHo}_2\text{O}_4 \) and \( \text{SrDy}_2\text{O}_4 \) A. D. BIANCHI, B. PREVOST, U. de Montreal, QC, Montreal, Canada, N. KURITA, F. RONNING, R. MOVSHOVICH, T. W. KLIMCZUK, LANL, Los Alamos, 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 \( \text{SrHo}_2\text{O}_4 \) and \( \text{SrDy}_2\text{O}_4 \) 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 \( C_{ph} \) by using a temperature dependent Debye temperature determined from measurements on the non-magnetic structural analogue \( \text{SrLu}_2\text{O}_4 \). After this subtraction, in \( \text{SrHo}_2\text{O}_4 \) we observed a broad anomaly in the magnetic specific heat \( C_{mag} = C_p - C_{ph} \) 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. \( \text{SrDy}_2\text{O}_4 \) 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 \( \text{SrHo}_2\text{O}_4 \).

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