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Synthesis and Characterization of New Germanate Pyrochlores, $A_2Ge_2O_7$ (A = Tb, Yb, Er) ALANNAH HALLAS, Department of Chemistry, University of Manitoba, HAIDONG ZHOU, Department of Physics and Astronomy, University of Tennessee, ANGEL AREVALO LOPEZ, University of Edinburgh, HARLYN SILVERSTEIN, Department of Chemistry, University of Manitoba, J. PAUL ATTFIELD, University of Edinburgh, CHRISTOPHER WIEBE, Department of Chemistry, University of Winnipeg — The titanate pyrochlores, $A_2Ti_2O_7$, have yielded some of the most well-studied geometrically frustrated magnetic materials. A new class of pyrochlores with germanium on the B-site is now being investigated. The germanates, which in many cases share ground states with their titanate analogues, are far more highly correlated due to the smaller B-site cation. Two germanate pyrochlores, $Ho_2Ge_2O_7$ and $Dy_2Ge_2O_7$, were previously synthesized and characterized as new spin ice compounds [1-3]. We now present the new germanate pyrochlores, $A_2Ge_2O_7$ with A = Tb, Yb, and Er. Based on the titanates, three distinctly different magnetic ground states can be expected for these materials: $Er_2Ti_2O_7$ has an "order-by-disorder" mechanism, $Yb_2Ti_2O_7$ is a quantum spin ice and $Tb_2Ti_2O_7$ is a spin liquid. Preliminary measurements on $Tb_2Ge_2O_7$ indicate that it too is a spin liquid down to at least 0.35 K. We will present the characterizations of $A_2Ge_2O_7$ (A = Tb, Yb, Er) and compare them to the titanates.

[1] H. D. Zhou et al., Nature Communications 2, 478 (2011).
[2] H. D. Zhou et al., Phys. Rev. Lett. 108, 207206 (2012).
[3] A. M. Hallas et al., accepted for publication in Phys. Rev. B (2012).

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