Abstract Submitted
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Magnetic and Transport Properties of Tb and Y Molybdate Pyrochlores[1] R.P. GUERTIN, Tufts Univ., E.-S. CHOI, C. WIEBE, NHMFL/FSU, H. ZHOU, zhou@magnet.fsu.edu — The transport, magnetic, and magnetotransport properties of single crystal $Tb_2Mo_2O_7$ and $Y_2Mo_2O_7$ are reported. The Mo cation carries a small magnetic moment (<1 É$_B$), but neither system shows long-range magnetic order due geometrical frustration. Short-range (∼5 A) correlations [1] cause Mo magnetization irreversibility below T_{irr} ∼24 K - a spin glass-like anomaly. The pressure dependence of T_{irr} for $Tb_2Mo_2O_7$ is strongly negative (-0.24 K/kbar), consistent with similar pressure studies in $(Tb_{1-x}La_x)_2Mo_2O_7$ [2]. High dc field (33 T) isothermal magnetization shows $Tb_2Mo_2O_7$M(H) is not fully saturated due to crystal field splitting and nearly linear $Y_2Mo_2O_7$ M(H) attains only ∼0.4 É$_B$/f.u, A metal-insulator transition (MIT) in $Tb_2Mo_2O_7$ occurs at T∼50 K, with resistivity Éœ(T) rising >10X by T=10 K. The temperature dependence of the Hall resistivity, thermopower, and magnetoresistance are consistent with the MIT. The buildup of the magnetic clusters and the MIT occur at substantially the same temperature, and is discussed in terms of the electronic localization of the charge carriers.

[1] B. D. Gaulin et al, Phys. Rev. Lett. 69, 3244 (1992).
[2] A. Apetrei et al, Phys. Rev. Lett. 97, 206401 (2006).

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