Abstract Submitted
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Anisotropic transport and structure of single-crystal molybdenum bronze, $Li_{0.33}MoO_3$[1] SAEED MOSHFEGHYEGANEH, JOSHUA L. COHN, University of Miami, JOHN J. NEUMEIER, Montana State University — We present transport measurements (resistivity, thermopower, thermal conductivity) on single crystals of the quasi-one-dimensional (Q1D), small-gap semiconductor[a] $Li_{0.33}MoO_3$ in the temperature range 150-500 K. The Q1D character of this material is reflected in $T = 300$ K resistivity ratios, ρ_c:ρ_a:$\rho_{b^*} \simeq$ 1:20:180, and extreme anisotropy in the Seebeck coefficient within the $a-c$ planes, $S_c - S_a \simeq 250$ μV/K. A weak structural anomaly near $T_s = 355$ K (0.001Å expansions along c^* and b^* directions, comparable contraction along a^*) is identified in the temperature-dependent lattice constants from x-ray diffraction, and is coincident with changes in the transport coefficients. Analysis of the transport data at $T > T_s$ shows that an intrinsic semiconductor model can be applied to explain transport along the most conducting c axis, but along a and b^* the transport is better described by a non-adiabatic, small-polaron picture.

[a] B. T. Collins *et al.*, J. Sol. St. Chem. **76**, 319 (1988).

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