

Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Thermal conductivity of spinel MnV_2O_4 with doping
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Department of Physics, Waseda University — Spinel MnV_2O_4 exhibits
a structural phase transition and ferrimagnetic ordering simultaneously
at 57 K. The crystal symmetry in the low-temperature phase obtained
by the x-ray diffraction of a single crystal indicates an antiferro-orbital
ordering of V t_{2g} states [1]. It was also found that Al doping into the
V site suppresses the orbital-ordering temperature (T_{oo}) but barely af-
fects the ferrimagnetic-ordering temperature (T_{N}); thus two transition
temperatures are separated in the Al-doped samples. We measured the
thermal conductivity of $\text{Mn}(\text{V}_{1-x}\text{Al}_x)_2\text{O}_4$, and found that thermal con-
ductivity sharply increases (thermal resistivity decreases) below T_{oo} . It
was also found that, with applied magnetic field, thermal resistivity in-
creases above T_{oo} but decreases below T_{oo} . These results indicate that
thermal conductivity is dominated by the fluctuation of orbital ordering.
[1] T. Suzuki *et al.*, Phys. Rev. Lett. 98, 127203 (2007).

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Date submitted: 11 Nov 2011

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