

Abstract Submitted
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Orbital ordering in spinel AV_2O_4 ($A=Mn,Fe$) T. KATSUFUJI, T. SUZUKI, M. KATSUMURA, H. TAKEI, Dept. of Physics, Waseda University, K. TANIGUCHI, T. ARIMA, Institute of Multidisciplinary Research for Advanced Materials, Tohoku University — In spinel vanadates, AV_2O_4 (A :divalent ion), there is an orbital degree of freedom in the V^{3+} ion, which contains two d electrons in the triply degenerate t_{2g} orbital. We measured the x-ray diffraction of the single crystal of MnV_2O_4 , which exhibits simultaneous ferrimagnetic and a structural phase transition at 57 K, and found that a diamond-glide symmetry is broken in the ferrimagnetic tetragonal phase in this compound, indicating the antiferro-type ordering of the V t_{2g} orbitals. This orbital ordering can be explained by the enhancement of the antiferro-orbital interaction caused by the ferromagnetic alignment of the V spins in the ferrimagnetic phase. We also measured the x-ray diffraction of the FeV_2O_4 single crystal, and found that a different type of orbital ordering from that of MnV_2O_4 occurs in this compound.

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