

Abstract Submitted
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Anomalous magnetic anisotropy in Mn_3O_4 investigated by $^{55}\text{Mn}^{2+}$ and $^{55}\text{Mn}^{3+}$ Nuclear magnetic resonance CHANGSOO KIM, JEONG HYUN SHIM¹, EUNA JO, SOONCHIL LEE, Department of Physics, Korea Advanced Institute of Science and Technology, Daejeon 305-701, Korea — Mn_3O_4 has Yafet-Kittel type spin structure below Neel Temperature (41K). The magnetization along the c-axis is smaller than that along the ab-plane even in external magnetic field of 30 Tesla, implying huge magnetic anisotropy in the ab-plane. We measured $^{55}\text{Mn}^{2+}$ and $^{55}\text{Mn}^{3+}$ Nuclear Magnetic Resonance (NMR) of a Mn_3O_4 single crystal in external magnetic field. The canting angles of Mn^{2+} and Mn^{3+} magnetic moments were calculated from the spectral shift obtained for various magnetic field directions between the a, b and c-axes. With the canting angle data, we estimated the anisotropy energies of the Mn^{2+} and Mn^{3+} magnetic moments and the exchange energy between them. The result also shows that Mn^{3+} spins in the Yafet-Kittel structure lie in the ab-plane contrary to the previous reports.

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