

Abstract Submitted
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The first-Order phase transition in β -MnO₂ studied by ⁵⁵Mn Nuclear Magnetic Resonance CHANGSOO KIM, EUNA JO, SOONCHIL LEE, Korea Advanced Institute of Science and Technology — β -MnO₂ has a conductivity due to negative charge carriers generated from slight off-stoichiometry of oxygens. We obtained ⁵⁵Mn antiferromagnetic nuclear magnetic resonance (NMR) signal for β -MnO₂ at low temperature for the first time. The resonance frequency of the main peak centered at 254 MHz is nearly unchanged from 4.2 K to 130 K though it is known that the magnetic phase changes near 94 K from the antiferromagnetic state to the paramagnetic state. This suggests that the magnetic phase transition is a first order transition and the mixed phases coexist both below and above the phase transition temperature. Side peaks were found at 161 MHz, 181 MHz and 297 MHz. Through annealing β -MnO₂, which generates oxygen defects, we investigated whether these peaks originate from manganese ions with their valence other than 4+. However, the NMR spectra of the annealed β -MnO₂ showed no difference in side peaks.

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