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Fe₃O₄ thin films: from worse to better than the bulk L.H. TJENG, X.H. LIU, C.F. CHANG, A.D. RATA, A. KOMAREK, Max Planck Institute for Chemical Physics of Solids, Dresden — Magnetite Fe₃O₄ is one of the most investigated materials from the class of transition metal oxides. It shows a first-order anomaly in the temperature dependence of the electrical conductivity at T_V= 125 K, the famous Verwey transition. However, thin films of Fe₃O₄ show always a lower T_V compared to the bulk material. The transition in films is also always much broader than in the bulk. In order to find out the reason, we have performed a systematic investigation of the transport properties in dependence of the oxygen pressure, thickness, and the choice of the substrate. The findings point us the way how to grow films that have very sharp transitions with even higher T_V than the bulk material.

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