

Influence of Deposition Rate on MgB₂ Thin Films Grown by Co-evaporation Method

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Magnesium diboride (MgB₂) is an inexpensive and simple superconductor. This material was first synthesized and its structure confirmed in 1953 but its superconducting properties were not discovered until half a century later. Since superconductivity of MgB₂ was discovered in 2001. In this study, superconducting MgB₂ thin films on the *r*-Al₂O₃ substrates have been grown by the combination of radio frequency magnetron sputtering of B and thermal evaporation of Mg. The deposition conditions were varied by changing deposition rate. Before the co-evaporation of Mg and B, the deposition rates of each element have been measured separately. The MgB₂ layers had 400nm in thickness and superconducting transition temperatures have been measured around ~38.6K. Superconducting properties have been measured by PPMS, XRD, and SEM.

Keywords: MgB₂, co-evaporation, deposition rate

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