

Growth of MgB₂ Thin Films by LACVD

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We have fabricated superconducting MgB₂ thin films by laser assisted chemical vapor deposition (LACVD) technique. For the LACVD process, we used the Mg target and a mixture of 5% B₂H₆ gas in H₂. The Mg and the B sources were obtained from pulsed laser ablation and inlet gas, respectively. The MgB₂ thin films were grown on the Al₂O₃ (0001) substrate at various temperature ranges of 280 – 340 °C under about 0.1 Torr. These samples showed a superconducting transition temperature (T_c) of about 19 – 33.5 K. When the B₂H₆ gas flow rate was 20 sccm and substrate temperature was 320 °C, we have obtained the film of the maximum T_c . This sample had high resistance ($\sim 8 \Omega$) at room temperature. We consider that the reason of lower T_c and higher resistance is due to a lack of Mg during the MgB₂ films growth.

Keywords: MgB₂ thin film, LACVD, pulsed laser ablation