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Epitaxial growth of MgB₂ films at ambient temperature HIROAKI SHISHIDO, TAKUYA YOSHIDA, TAKATOSHI NAKAGAMI, TAKEKAZU ISHIDA, Department of Physics and Electronics, Graduate School of Engineering, Osaka Prefecture University — We grew crystalline MgB₂ thin films using molecular beam epitaxy at a low substrate temperature of 110 °C under an ultrahigh vacuum of about 10⁻⁶ Pa. MgB₂ thin films were deposited on the (001) surface of a 4H-SiC substrate with an epitaxial Mg buffer layer. The epitaxial growth was confirmed by X-ray diffraction measurements. MgB₂ thin films show a sharp superconducting transition at 27.2 K, with a relatively narrow superconducting transition width $\Delta T_c = 0.9$ K. The growth temperature was lower than any in prior reports on superconducting MgB₂ thin films. The presence of the epitaxial Mg buffer layer is crucial for reducing the epitaxial temperature.

Hiroaki Shishido
Department of Physics and Electronics, Graduate School of Engineering, Osaka Prefecture University

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