

Epitaxial antiferromagnetic FeMn thin films on GaAs(100): growth and magnetic properties

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FeMn is known to antiferromagnetic material with L1₀ structure [1]. Antiferromagnetic materials have attracted great attention in technological applications such as spin-valve and MTJ (magnetic tunnel junction) since the discovery of the exchange bias associated with the interface between ferromagnetic and antiferromagnetic materials [2-4]. Here, we report the epitaxial growth of FeMn thin films on GaAs(100) substrate by using molecular beam epitaxy (MBE). The base pressure of the chamber was 3.4×10^{-9} Torr. The growth rate of FeMn and substrate temperature were 0.38 Å/s and $T_S = 400$ °C, respectively. The growth was monitored with RHEED (reflection high-energy electron diffraction). Figure 1 shows a streaky RHEED pattern of FeMn thin films grown on GaAs(100), indicating the layer-by-layer growth of FeMn thin films. We will present the structural, electrical and magnetic properties of FeMn thin films determined using a Quantum Design SQUID (superconducting quantum interference device), PPMS (physical property measurement system), and X-ray diffraction.

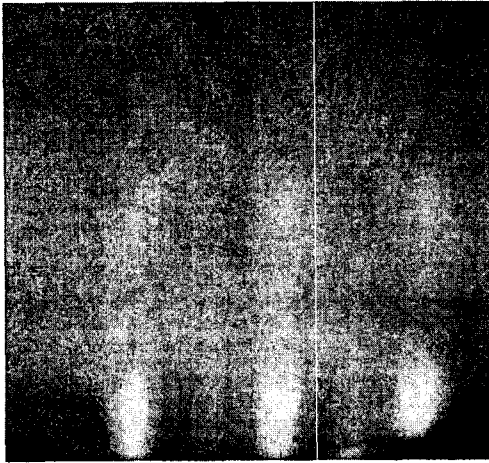


Figure 1. RHEED pattern of FeMn thin films on GaAs(100) at $T_s=400$

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