

# Magnetotransport Properties of CrAs Thin Films on Si(111) Substrate

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Epitaxial magnetic films on semiconductor substrates such as Si and GaAs have attracted a great deal of attention due to applications to new magnetic/semiconductor and spintronic devices [1-3]. The CrAs compound presents the orthorhombic MnP-type structure and a first-order helimagnetic-paramagnetic transition accompanied by discontinuous changes in the crystallographic parameters at 265 K [4]. On the other hand, epitaxial growth of magnetic films on a semiconductor substrates allow the synthesis of specific crystallographic structures and/or properties that are absent in their bulk, and often the magnetic properties of the thin films dramatically depend on the growth conditions and structures of the substrates. Interestingly, Akinaga et al. grew the zinc-blende CrAs thin films on GaAs(100) substrates by molecular beam epitaxy (MBE), which exhibited ferromagnetic ordering at 300 K [5].

In this work, we have investigated the structure and magnetotransport properties of CrAs thin films grown on Si(111) substrates using MBE. The structure of CrAs films were determined by x-ray diffraction (XRD). In order to investigate the correlation between magnetization and charge carrier transport, we performed magnetoresistance (MR) and Hall resistance measurements by using a physical property measurement system. The transport and magnetic behaviors of our epitaxial CrAs films on Si substrates were significantly different than that of the bulk CrAs and thin film CrAs on GaAs substrate.

## 참고문헌

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