

The Modified Magnetic Properties of Mn₃Ga Ferrimagnet by Stabilizing on GaSb (001)

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Abstract

We report on the epitaxial growth of tetragonal DO_{22} -type Mn₃Ga films on GaSb (001) using molecular beam epitaxy and the related structural and magnetic properties. The as-studied Mn₃Ga film was found to exhibit relatively small coercivity around 400 Oe, which differs greatly from the hard magnetic properties of Mn₃Ga bulk specimen or films that are normally reported. This difference was probably attributed to the effects of the GaSb (001) substrate that forced the Mn₃Ga film to be two-dimensionally stabilized in the (114) orientation and thus led to the modified intrinsic properties of Mn₃Ga films. The growth orientation of the Mn₃Ga (114)//GaSb (001) also caused the easy magnetocrystalline direction located in the film plane due to the dominant shape anisotropy in the thin films.

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