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Influence of Ga content on structure and anomalous Hall effect of $\text{Fe}_{1-x}\text{Ga}_x$ thin films on GaSb(100) THI MINH HAI NGUYEN, ANH TUAN DUONG, YOOLEEMI SHIN, VAN QUANG NGUYEN, SUNGLAE CHO, Univ of Ulsan, Korea — The Fe-Ga alloys have recently attracted great interests because they exhibited ferromagnetic properties with high Curie temperature, high saturation magnetization and unique magnetostriction properties which are promising to real applications such as actuators, acoustic sensors, torque sensors, and positioning devices in particular for micro and nano-electromechanical systems and the integrated magnetostrictive devices. Recently, electrical spin injection from $\text{Fe}_{0.5}\text{Ga}_{0.5}$ produces an electron spin polarization above 70% on GaAs(001). However, the out-of-plane saturation field and magnetization decrease rapidly with Ga content. The $\text{Fe}_{1-x}\text{Ga}_x$ thin films ($x=0.4,0.5$) have been grown on GaSb(100) substrate using MBE. An epitaxial film with bcc α -Fe crystal structure (A2) was observed in $\text{Fe}_{60}\text{Ga}_{40}$ film, while an impure Fe_3Ga phase with DO_3 structure appeared in $\text{Fe}_{0.5}\text{Ga}_{0.5}$ film. The saturated magnetizations are $570\text{emu}/\text{cm}^3$ and $180\text{emu}/\text{cm}^3$ and the coercivities are 170 and 364Oe at room temperature for $\text{Fe}_{0.6}\text{Ga}_{0.4}$ and $\text{Fe}_{0.5}\text{Ga}_{0.5}$, respectively. A hysteresis trend in Hall resistance vs. magnetic field was observed for $\text{Fe}_{0.5}\text{Ga}_{0.5}$ film. However, there is a weak hysteresis in $\text{Fe}_{0.4}\text{Ga}_{0.6}$ film.

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