

Excellent magnetic properties of $\text{Co}_{52.5}\text{Fe}_{22.5}\text{Hf}_{10}\text{O}_{15}$ thin films

Tho Luu Van*

Chungnam National University

Nanocrystalline CoFeHfO thin films have been fabricated by RF sputtering method. It is shown that the CoFeHfO thin films possess not only high electrical resistivity but also large saturation magnetization and anisotropy field. Among the composition investigated, $\text{Co}_{52.5}\text{Fe}_{22.5}\text{Hf}_{10}\text{O}_{15}$ thin film is observed to exhibit good soft magnetic properties: coercivity (H_c) of 0.18 Oe; anisotropy field (H_k) of 52 Oe; saturation magnetization ($4\pi M_s$) of 36.2 kG. The frequency response of permeability of the film is excellent. The excellent magnetic properties of this film in addition of an extremely high electrical resistivity (ρ) of $530 \mu\Omega\text{cm}$ make it ideal for uses in high-frequency applications of micromagnetic devices. It is the formation of a peculiar microstructure that resulted in the superior properties of this film.