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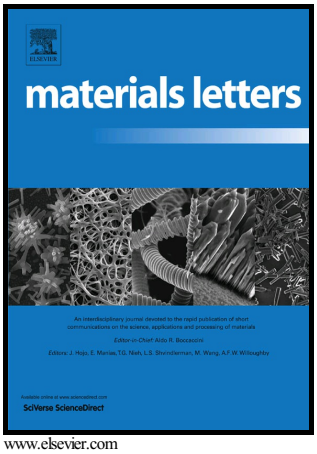

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ACCEPTED MANUSCRIPT

Highly c-axis oriented, self-biased and low loss barium ferrite thin films by sol-gel method

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Abstract:

Barium ferrite (BaM) thin films are deposited on Pt/TiO_2/SiO_2/Si wafers by sol-gel, and the orientation, self-biased property and millimeter wave loss were investigated. It is found that BaM has highly c-axis orientation, and the degree of texturing is as high as 0.97. Hysteresis loops reveal that saturated magnetization ($4\pi M_S$) is 4.1 kG, remanent magnetization is 94% of $4\pi M_S$, and BaM offer high self-biased property. In addition, the ferromagnetic resonance (FMR) measurement indicated that this thin film yields an anisotropy field of 15.8 kOe, and a smallest FMR linewidth of 118 Oe at 50 GHz. These phenomenon mean that this BaM thin film is suitable for application in millimeter wave devices such as ciuculator, filter and phase shifters, etc.

Keywords: Barium ferrite; thin film; sol-gel method

1. Inroduction

Typically, bulky penmanent magnet were used in magnetic microwave devices (MMD) to offer biasing magnetic field for controlling microwave propagation, hence these devices are large and cost[1]. The rapid development of consumer electronics and satellite communications, it requires that the next genaration of MMD will be miniaturized, self-biasing and low loss[2]. Self-biasing is a key property due to it can

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