

论文

Tb/Co成分调制膜的磁、磁光性能和热稳定性

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摘要: 用直流磁控溅射制备了Tb / Co成分调制膜膜调制结构的形成与靶的溅射速率和衬底转速密切相关对不同周期的Tb / Co膜的极向Kerr磁滞回线进行了测量, 结果表明: 当Tb / Co膜的周期较小时, 薄膜具有垂直方向的磁各向异性、较大的矫顽力和较大的磁光效应; 当Tb / Co膜的周期较大时, 上述性能变差。其机制可以用界面处Tb原子的单离子各向异性和Tb, Co原子间的铁磁耦合来解释。当300℃真空等温退火时, Tb / Co成分调制膜的热稳定性较差。

关键词: Tb / Co成分调制膜 垂直磁各向异性 Kerr角 热稳定性

MAGNETIC,MAGNETO-OPTICAL PROPERTIES AND THERMAL STABILITY OF Tb/Co MULTILAYER FILMS

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Abstract: Tb/Co thin films with an artificially layered structure are prepared by a dc magnetron-sputtering system. The form of the compositionally modulated structure is dependent on the deposition rates of Tb and Co targets, and the rotation speed of substrate. The layer-thickness dependence of Kerr rotation hysteresis loops was studied. The results show that the films have large perpendicular uniaxial anisotropy, large coercivity and large Kerr rotation when the period of Tb/Co film is small. These magnetic properties decrease when the period of Tb/Co film is large. The mechanism can be interpreted in terms of the single-ion anisotropy of Tb ions in the interface, and the ferrimagnetic coupling between Tb and Co atoms. The isothermal annealing of Tb/Co multilayer films at 300 oC shows that it has a bad thermal stability.

Keywords: Tb/Co compositionally modulated film perpendicular anisotropy Kerr rotation angle thermal stability

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