**ES09**

**Temperature Dependence of Magnetic Properties in Single Crystal FePt/FeRh bilayer**

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Recently, FePt/FeRh bilayers have attracted much attention, because of their potential application for heat assisted magnetic recording medium. It is known that ordered bcc FeRh alloys exhibit the first-order phase transition from antiferromagnetic to ferromagnetic upon heating at around 100°C [1] and ordered FePt layer has very large perpendicular magnetic anisotropy [2]. There are a lot of effects relating to this system, such as exchange bias, and the first-order phase transition. Until now the mechanism of these effects is still unclear. Therefore the aim of the present work is to conduct a systematically study of the temperature dependence of magnetic properties in single crystal FePt/FeRh bilayer. Bilayers FePt(50 nm)/FeRh(30 nm)/MgO(001) were fabricated using an FeRh target at substrate temperature of 450°C. An x-ray diffractometer and a vibrating sample magnetometer were used to characterize structure and magnetic properties of samples.

Fig. 1. Temperature dependence of magnetization, coercivity and exchange bias field of FePt/FeRh bilayer.

**ES10**

**Ferromagnetic Magnetization Reversal of Exchange-Biased NiFe/FeMn/CoFe Trilayers**

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Magnetic trilayers consisting of two ferromagnetic layers separated by a nonmagnetic metal or insulating layer have been known to exhibit the novel quantum phenomena such as an oscillatory interlayer exchange coupling and a spin-dependent tunneling during the last decade [1]. Although several theories and experiments have been reported on a few systems so far, there has been much attention on the magnetic trilayers intervened by an antiferromagnet [2]. Nowadays the NiFe/FeMn/CoFe trilayer has become one of the pivotal devices which have been widely utilized for the realization of magnetic tunnel junctions and a giant magnetoresistance spin valve. 30nm NiFe (bottom)/FeMn(3nm)/CoFe(40nm) with varying FeMn thickness from 0nm to 5nm were grown on a transparent silicon substrate using a magnetron sputtering at Ar working pressure of 1.5mTorr in a ultrahigh vacuum of 2.0x10⁻⁹ Torr. 5nm Ta underlayer was inserted to induce the FeMn (111) texture and 5nm Ta capping layer was deposited to prevent a sample surface from an oxidation. To induce the exchange anisotropy, a magnetic field of 300Oe was applied during a sample deposition. The magnetic hysteresis (M-H) loops were measured with a vibrating sample magnetometer (VSM). Exchange bias is not observed less than 5nm FeMn and increases proportional to FeMn layer thickness for more than 5nm. However, it is difficult to find the static and dynamic magnetic properties of each ferromagnetic layer such as magnetic depth profile, switching Edk, and magnetic reversal process only from VSM loops due to hysteresis superposition. Longitudinal and transverse magnetooptical Kerr (L-TOKE) system's loops were measured by probing front and back sides of a sample with a wavelength of 780 nm. The complementary combination of front-back L-TOKE and VSM can give the valuable information about magnetization dynamics of each ferromagnetic layer exchange-biased by a common antiferromagnetic layer.

This work was supported by KOSEF(Nuclear RD program, Basic Research Program No. B01-2007-000-20281-0), and KICO(Graceful Balance Program, No. K20702002143) through a grant provided by the Korea government(MEST).