

## FeMnPt 多結晶薄膜の結晶構造と磁気相図

長谷川 崇,\* 石尾 俊二\*

Magnetic Phase Diagram and Crystalline Structure of Polycrystalline FeMnPt Films

Takashi HASEGAWA<sup>†</sup> and Shunji ISHIO<sup>†</sup>

Crystalline structure and magnetic properties of ordered and disordered  $\text{Fe}_{1-x}\text{Mn}_x\text{Pt}_y$  films (100 nm thick) were studied, and the magnetic phase diagrams were investigated. In ranges of both  $0 \leq x \leq 0.4$  and  $0.45 \leq y \leq 0.85$ , all of the films had  $A1$  type (face-centered cubic) disordered structure before annealing. At room temperature, the saturation magnetization ( $M_s$ ) of the disordered  $\text{Fe}_{0.5-x}\text{Mn}_x\text{Pt}_{0.5}$  and  $(\text{Fe}_{0.5}\text{Pt}_{0.5})_{1-x}\text{Mn}_x$  films decreased with increasing the amount of Mn addition ( $x$ ) due to its decreasing of the Curie temperature ( $T_c$ ). After annealing at 600°C for 1 hour, almost of all films with ranges of  $0 \leq x \leq 0.4$  and  $0.45 \leq y \leq 0.85$  had  $L1_0$  type (face-centered tetragonal;  $a = b > c$ ) ordered structure. Ordered  $(\text{Fe}_{0.5}\text{Pt}_{0.5})_{1-x}\text{Mn}_x$  films with  $0 \leq x < 0.29$  excepting  $x = 0.23$  had high  $M_s$  of  $500 \leq M_s \leq 800 \text{ emu/cm}^3$ . These results suggest realizing an advantaged bit patterning process using the order-disorder transition.

**Key Words** : FeMnPt film, Magnetic phase diagram, Order-disorder transition, Magnetization, Coercivity