Substrate Temperature Dependence of Crystalline Microstructure for CoCrTa Films

H. Tamai and K. Tagami (Microelectronics Res. Labs., NEC Corporation)

These photographs show transmission electron diffraction patterns and TEM micrographs for CoCrTa films, which were deposited under differing substrate temperature Ts (60°C, 100°C and 140°C). Diffraction patterns, such as (100), (110) and (200), are observed for the hcp-Co planes. Crystalline grain sizes decrease with increasing Ts. Furthermore, perpendicular anisotropy field Hk and perpendicular coercivity Hc⊥ values increase with increasing Ts. A fine grain structure with good c-axis orientation and high Hc⊥ are obtained by the addition of Ta to CoCr films under high Ts.