Preferred oriented growth of L10 FePt on Si substrate

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Tilting the magnetic easy axis of L10 FePt and/or introducing a magnetic buffer layer is most effective in realizing the L10 FePt based magnetic recording media.Therefore, here we report on the preferred oriented growth of L10 FePt with tilted magnetic easy axis. FePt films of thickness up to 110 nm were deposited on Si substrates with a soft magnetic underlayers of glassy FeSiB, FeSiBP and CoFeTaB. Effects of processing conditions on the structural and magnetic properties were studied.Our results demonstrated that the direct growth of FePt on FeSiB or FeSiBP metallic glass is polycrystalline. The CoFeTaB glassy thin film acts as a very stable underlayer for the growth of FePt. A preferred oriented growth of FePt along (111) crystallographic direction was obtained. The Hc reduces significantly with the introduction of underlayer. The magnetic easy axis of (111) L10 FePt is 36 degree titlted and is very promising for titled magnetic recording. The details on the structural/magnetic properties and its applicability in magnetic recording will be presented.