The influence of tantalum content in relation to substrate temperature on magnetic and structural properties of Co Cr Ta thin films

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Abstract: In this study, we investigated the influence of Ta content (in $Co_{86}Cr_{12}Ta_2$ and $Co_{82}Cr_{13}Ta_5$ compositions) on magnetic and structural properties of Co-Cr-Ta perpendicular media samples grown on Si substrates at different substrate temperatures during RF-sputter deposition. In general, coercivity of $Co_{82}Cr_{13}Ta_5$ samples is higher than that of $Co_{86}Cr_{12}Ta_2$ samples, whereas the perpendicular c-axis orientation of $Co_{86}Cr_{12}Ta_2$ samples is better. Ta content was suggested to be in between 2 and 5 at% to give optimum magnetic and structural properties.

Author Keywords: RF-sputtering; Substrate temperature; Tantalum; Thin films

Index Keywords: Cobalt compounds; Coercive force; Crystal growth; Crystal orientation; Silicon; Substrates; Tantalum; Perpendicular axis orientation; Magnetic thin films

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