Effect of Ni or Cr enrichment on the properties of magnetic Co-based sputter deposited coatings

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Magnetic thin layers have been extensively studied in recent years because of their numerous applications in the field of microelectronics. In particular, magnetic cobalt based materials present properties allowing their use in sensors, actuators or as data storage material. In this paper, we investigate the deposition of about 1 µm thick Co-Ni and Co-Cr coatings, with Ni or Cr contents in the range 0-30 at.\%, deposited on rotating substrates by co sputtering of Co and Ni or Cr metallic targets. After a short description of the experimental deposition device, we focus on the structure and microstructure of the coatings as a function of their Ni or Cr content. A particular attention is paid to the texture of the films as a function of their composition. Electrical and microhardness tests using respectively by four-point probe method and nano hardness test are then performed for coatings deposited on glass substrates. Finally, magnetic measurements are performed by vibrating magnetometry. All those results are then discussed regarding to the composition-microstructure-magnetic performance in view of potential application in magnetography.

Keywords
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