

**GLANCING VERSUS NORMAL XRF EXCITATION WITH  
MONOCHROMATIC AND POLYCHROMATIC RADIATION FOR THE  
COMPOSITION ANALYSIS OF SmCo BASED FILMS ON SILICON WAFERS,**

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SmCo based magnetic films as used for either permanent magnet film applications or as high storage density magnetic recording media typically contain Fe, Zr, and Cu in addition to Sm and Co. The magnetic properties are most sensitive to the relative amounts of the magnetic elements Co, Sm, and Fe. By varying the sputtering parameters during the film deposition, the Sm/Co ratio in the deposited films can be changed over an appreciable range. Sputtered films can be made to exhibit single phase behavior over composition ranges for which bulk samples form as multiphase materials. Glancing incidence XRF excitation with monochromatic Cu radiation has been used to obtain Sm to Co and Fe to Co X-Ray intensity ratios that vary monotonically with composition ratios. X-Ray intensity ratios have been converted to compositions by using a set of coefficients determined iteratively from a set of known compositions. Monochromatic excitation at  $1^\circ$  to the film surface was found to give the greatest sensitivity to Sm/Co composition changes. The thickness of the SmCo based films was determined nondestructively by an X-Ray attenuation method we have previously reported.