

## CORRELATION BETWEEN GROWTH AND MAGNETIC PROPERTIES OF Fe/Ti MULTILAYERS

**K. Smardz<sup>a</sup>, L. Smardz<sup>b</sup>**

<sup>a</sup>Institute of Materials Science and Engineering, Poznań University of Technology,  
M. Skłodowska-Curie 5 Sq., 60-965 Poznań, Poland

<sup>b</sup>Institute of Molecular Physics, Polish Academy of Sciences, Smoluchowskiego 17 St.,  
60-179 Poznań, Poland

Fe/Ti multilayers (MLs) were prepared onto glass and oxidised Si(111) substrates at 295 and 520K using UHV RF/DC magnetron sputtering. Planar growth of the Fe and Ti sublayers deposited at 295K was confirmed in-situ by X-ray photoelectron spectroscopy (XPS). We have observed exponential variation of the XPS Fe-2p and Ti-2p integral intensities with increasing sublayer thicknesses. On the other hand, quantitative XPS analysis and comparison with a model system revealed a significant interface alloying during the deposition process at 295 K. Furthermore, results showed that the deposition of the 0.18 nm - Fe / 0.22 nm -Ti ML at 520 K leads to the formation of an uniform nanocrystalline Fe-Ti alloy film due to interdiffusion process. Systematic structural and magnetic studies showed, that iron sublayers grow on Ti in the soft magnetic nanocrystalline phase up to a critical thickness  $d_{\text{crit}} \sim 2.3$  nm. For a thickness greater than  $d_{\text{crit}}$ , the Fe sublayers undergo a structural transition to the polycrystalline phase with much higher coercivity.

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