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STRUCTURAL CHARACTERIZATION OF NiFe/Cu/NiFe TRILAYER FILMS: EFFECT OF COPPER LAYER THICKNESS

In this study, we obtained films with the NiFe/Cu/NiFe structure were obtained by cathodic erosion, with the NiFe layers maintaining a constant thickness of 100 nm and the intermediate copper (Cu) varying in thickness from 100, 200, and 300 nm. The structural characterization was carried out by X-ray diffraction (XRD) and scanning electron microscopy (SEM). Consistent with previous literature [1], the XRD results demonstrated a face centered cubic (FCC) crystalline structure in all samples. Notably, as the thickness of the Cu layer increased, the intensity of the characteristic copper peaks also increased, indicating an enhanced crystallinity of the deposited layers. The SEM analysis shows that increasing the thickness of the Cu layer leads to an increase in the grain size of the films. These results suggest a relationship between the thickness of the Cu layer and the change in the structure of the trilayer systems. This characterization provides valuable information on how the thickness of the copper layer affects the microstructure of the systems, which is essential for potential applications in the fields of electronics and magnetism. A correlation between structural properties and electrical behavior is discussed.

Keywords

Cu, NiFe, Films, XRD, SEM

Reference

Liu, M., Wang, Z., Meng, Z., Sun, X., Huang, Y., Guo, Y., & Yang, Z. (2023). Giant Magnetoimpedance Effect of Multilayered Thin Film Meanders Formed on Flexible Substrates. *Micromachines* 14(5). (2023).

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