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WITHDRAWN Growth of Cu-Ni (90/10) films by DC magnetron sputtering

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It is a common fact about alloys that surface chemical composition varies from the bulk in terms of elemental ratio and chemical state of the elements which can affect their material performances. That's why deposition of alloy films is very challenging. We prepared CuNi (90/10) alloy thin films by D.C. magnetron sputtering on Si(111) substrates and studied the effect of deposition times and sputtering powers on their surface and bulk chemical compositions and microstructures. According to XRD studies, all deposited films were composed of single phase CuNi (90/10) alloy and predominantly (111) textured. Crystallite sizes increased linearly with the increase in deposition times and sputtering powers. SEM studies revealed that sputtering powers have relatively stronger influence on the surface roughness and island formation as compared to the deposition times. Our XPS analysis showed slight Ni enrichment on the surface and presence of Ni2O3 along with NiO strongly which strongly suggested existence of a surface defect in all films. Furthermore, there was a clear evidence of presence of CuO along with Cu2O as Cu2p core level had a strong satellite peak. Neutron Reflectometry measurements, indicated that the film thickness increases linearly both with deposition times and sputtering times.

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