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Characterization of Electroplated Permalloy Film on Microstructure for Bio-MEMS Application (Conference Paper)

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Abstract

Thick films (approximately 120microns) of microstructure permalloy were electrodeposited by a direct DC electroplating process for 3 hours. The bath contained mixed baths of sulfate and chloride, a buffer and a stress reducing agents. The bath pH was 3.3. The voltage and current value were controlled to get the desired thickness in uniform of permalloy coatings. The permalloy is deposited on microchannel with dimension of 80µm x 4500µm x 1840µm. A negative photoresist of AZ125nXT was used to pattern the microchannel by photolithography process. These electrodeposition of Ni-Fe magnetic films can be utilized to induce live cells manipulation such as separation of blood cells, proteins, etc for Bio-MEMS application. Therefore, the characterization study is important to be understand. Here, we studied the effect of electroplating time to produce thick film of permalloy on the surface morphology, scanning electron microscopy, optical microscope, X-ray diffraction and energy dispersive X-Ray. The thickness film increased due to the long period of plating time with plating rate 0.55 µm/min with ration of permalloy produced 86.08:13.92 wt% of nickel-iron. © 2019 IEEE.

SciVal Topic Prominence

Topic: Electrodeposition | Cobalt alloys | Ni content

Prominence percentile: 83.010



Author keywords

[AZ125nXT](#) [Bio-MEMS](#) [DC electroplating](#) [Permalloy](#) [plating time](#) [U-shaped channel](#)

Indexed keywords

Engineering controlled terms:

[Blood](#) [Chlorine compounds](#) [Electrodes](#) [Electroplating](#) [Iron alloys](#) [Microchannels](#) [Microstructure](#) [Molecular biology](#) [Morphology](#) [Nanoelectronics](#) [Nickel alloys](#) [Photoresists](#) [Reducing agents](#) [Scanning electron microscopy](#) [Sulfur compounds](#) [Surface morphology](#) [Thick films](#)

Engineering uncontrolled terms

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