

Alloy-metal Barcode Nanowires

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1. Introduction

Nanostructured materials have played a great role as fundamental building blocks for optical, magnetic, electrical nanodevices [1]. Particularly, as hybrid Nanowires have diverse properties. The hybrid nanowires are promising for biological applications such as sensor, cell-separation and magnetic labeling.

2. Experiment

In this work, the $\text{Fe}_x\text{Ni}_{1-x}/\text{Au}$ barcode Nanowires were fabricated in pulse electrodeposition using anodized aluminumoxide(AAO) nanotemplates. The Ni nanowires were deposited in the solution of $\text{NiSO}_4 \cdot 6\text{H}_2\text{O}$ and H_3BO_3 . The nanowires were characterized by SEM, TEM, XRD and their structure and magnetic properties were investigated.

3. Result and Discussion

The X-ray powder diffraction patterns of the FeNi and FeNi/Au barcode Nanowires grown in an AAO nanotemplate is shown in Fig. 1a. The peaks at 44.015, 51.396 and 75.458 may be assigned to the FeNi (111), (200), and (220), while those at 38.202, 44.447 and 64.601 are assigned to Au(100), (200) and (220). Fig. 1b shows the morphology of the FeNi/Au Nanowires in AAO by FE-SEM, which were used for preparation of the barcode Nanowires. The magnetic measurements of the FeNi/Au nanowires were performed by VSM in Fig. 1c.

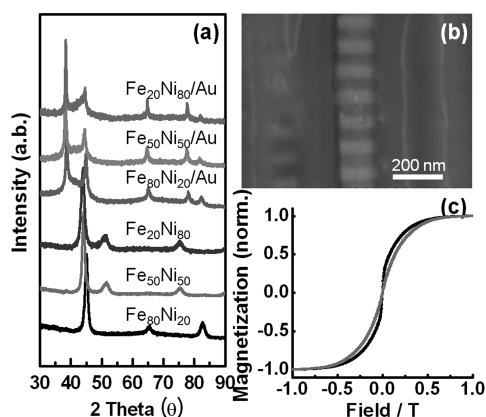


Fig. 1. (a) X-ray diffraction spectrum deposited on AAO of FeNi and FeNi/Au Nanowires. (b) SEM image and (c) VSM data of FeNi/Au barcode nanowires

4. Reference

- [1] J. H. Lee, J. H. Wu, H. L. Liu, J. U. Cho, M. K. Cho, B. H. An, J. H. Min, S. J. Noh and Y. K. Kim, *Angew. Chem. Int. Ed.*, 46,3663(2007)