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# Synthesis and Magnetic Property of Cu doped CoPt-Pt Barcode Nanowires

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Magnetic multilayered (barcode) nanowires are of interest owing to their unique properties, multifunctionality and potential applications in magneto-optic recording, nano-device and biosensing [1]. Especially, CoPt nanostructure prospects for high density recoding media. To achieve desired magnetic property, however, thermal processing is commonly needed at high temperature (>600 $^{o}$C). Based on the previous study on the effect of Cu doping in CoPt alloy nanowires [2], we report here the fabrication and characterization of Cu-doped CoPt-Pt barcode nanowires, synthesized by pulse electrodeposition from a single solution containing Co, Pt and Cu ions in anodic alumina oxide (AAO) nanotemplates. TEM shows that robust nanowires were successfully deposited (Fig. 1a), which possess the expected alternative bilayer nanostructure arrangement (Fig. 1b). For example, single nanowires can have a diameter of 50 nm and the segmental lengths 100 nm and 40 nm for CoPt and Pt layers respectively. TEM-EDX analysis reveals that the Cu-doped CoPt layer has a nominal composition of 66 % Co, 22 % Pt and 12 % Cu in atomic ratio. The multilayered nanowire arrays exhibit a magnetization easy-axis parallel to the nanowire axis (Fig. 1c). In the presentation, the structure-property relation is to be addressed.

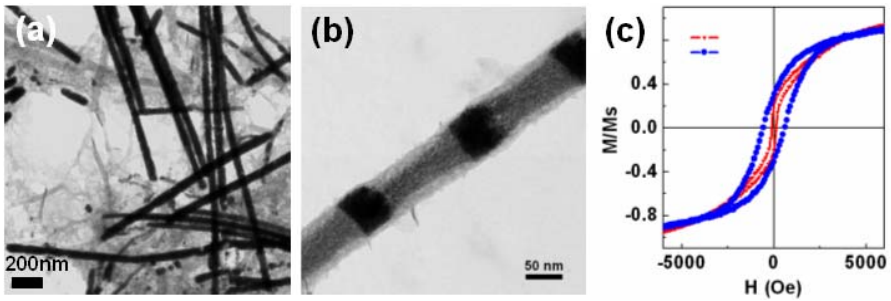


**Fig. 1.** Electrodeposited Cu doped CoPt/Pt barcode nanowires. (a) TEM morphology, (b) Barcode nanostructure, and (c) Hysteresis curves of the nanoarray.

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**REFERENCES**

[1] J. Lee *et al*., Angew. Chem. Int. Ed. 46, 3663 (2007).
[2] J. Min *et al*., J. Appl. Phys. 12, 7777 (2008).

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