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Supplementary Materials

Nanoscale characterization and magnetic property of $Co_{81}Cu_{19}$/Cu multilayer nanowires

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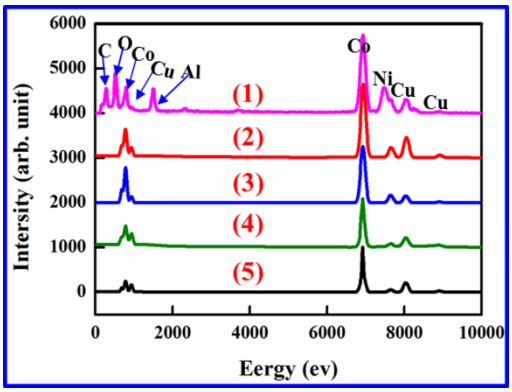

Figure S1. EDX spectra of the electrodeposited CoCu nanowires were obtained at the five different areas.

Times	Co atomic (%)	Cu atomic (%)
1	80.74	19.26
2	81.22	18.78
3	81.23	18.77
4	80.93	19.07
5	80.91	19.09
average value	81.006	18.994
	81.006±0.266	19.994+0.266

Table S1. The proportions of elements (Co:Cu) acquired from the Figure S2.

The composition estimation of Co-rich layer by using Vegard's law:

Vegard's law [S1] states that the lattice constant in a bulk binary alloy results from linear interpolation between the lattice constants of the pure constituent elements. Its formula is $a = xa_1 + (1-x)a_2$, where a, a_1 and a_2 are the lattice constants of the bulk binary alloy and their pure constituent elements, respectively; x is the atomic ratio of one of the constituent elements in the binary alloy. In our case, as determined by above SAED measurements, the lattice constant a of the CoCu alloy nanowires is 3.55 Å, the lattice constant a_1 of pure Co nanowire is 3.54 Å, and the lattice constant a_2 of Cu nanowire is 3.61 Å. The atomic ratio x of Co is then calculated to be 84.85%. This value is matched with the experimental data (x=81%) measured by EDX in error.

Reference

S1: L. Vegard, Z. Phys., 1921, **5**, 17.