Electronic Supplementary Material (ESI) for RSC Advances.


**Electronic Supplementary Information to:**

# Systematic tuning of segmented magnetic nanowires into three-dimensional arrays of 'bits'

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Contents:

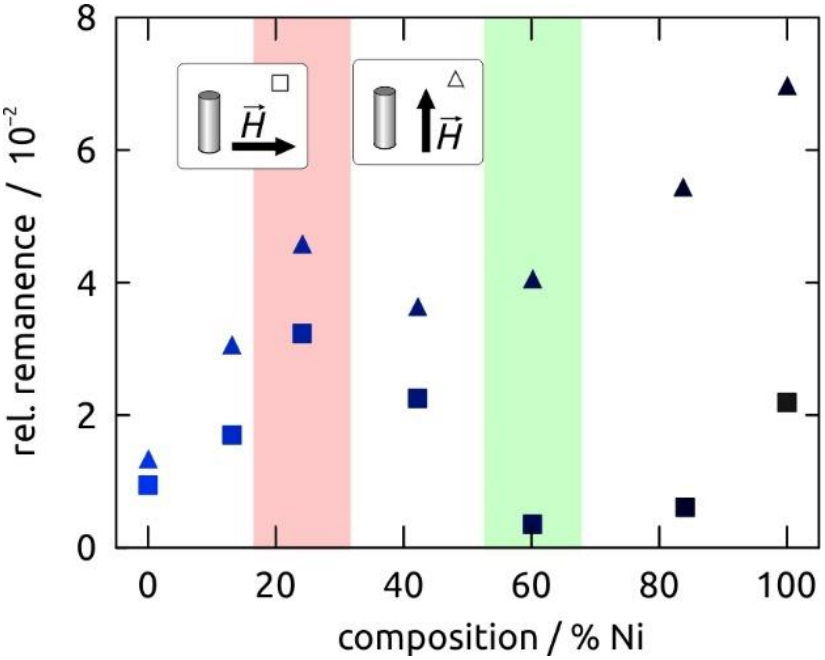


**Figure S1.** Dependence of the remanence of ordered $Ni_xCo_y$ wire arrays on the composition, obtained from SQUID magnetometry with the wires' long axis oriented parallel to the applied field (triangles) and perpendicular to it (squares).

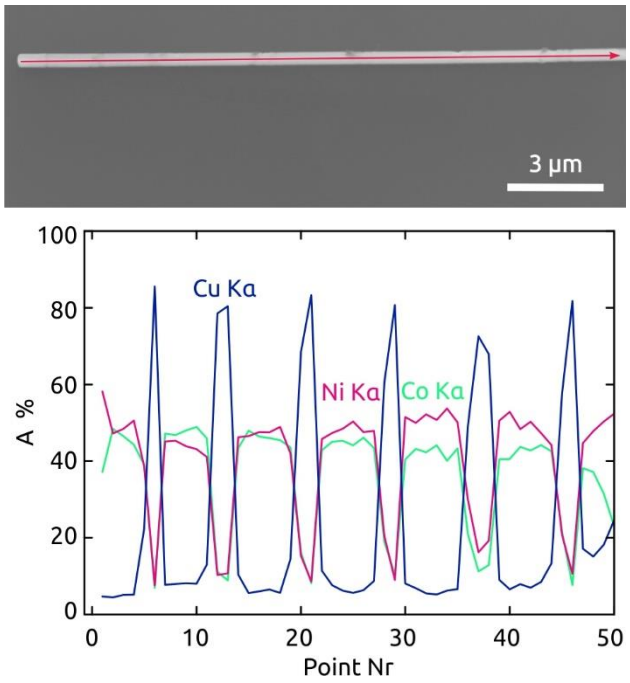


**Figure S2.** Quantitative EDX line analysis of the wire presented in **Figure 7a** of the main text.

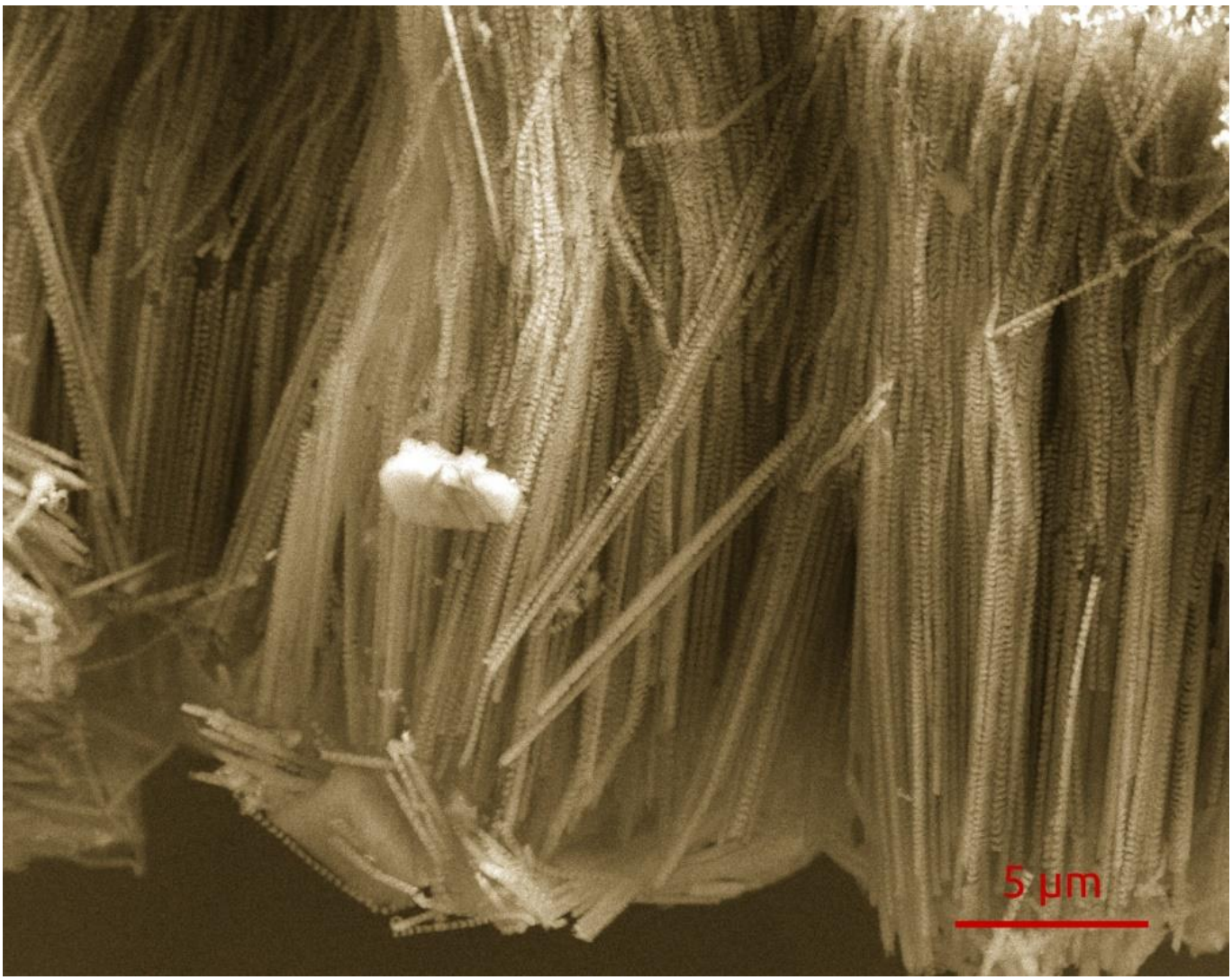


**Figure S3.** Scanning electron micrograph of segmented NiCo / Cu wires isolated from the alumina matrix by etching in potassium hydroxide.

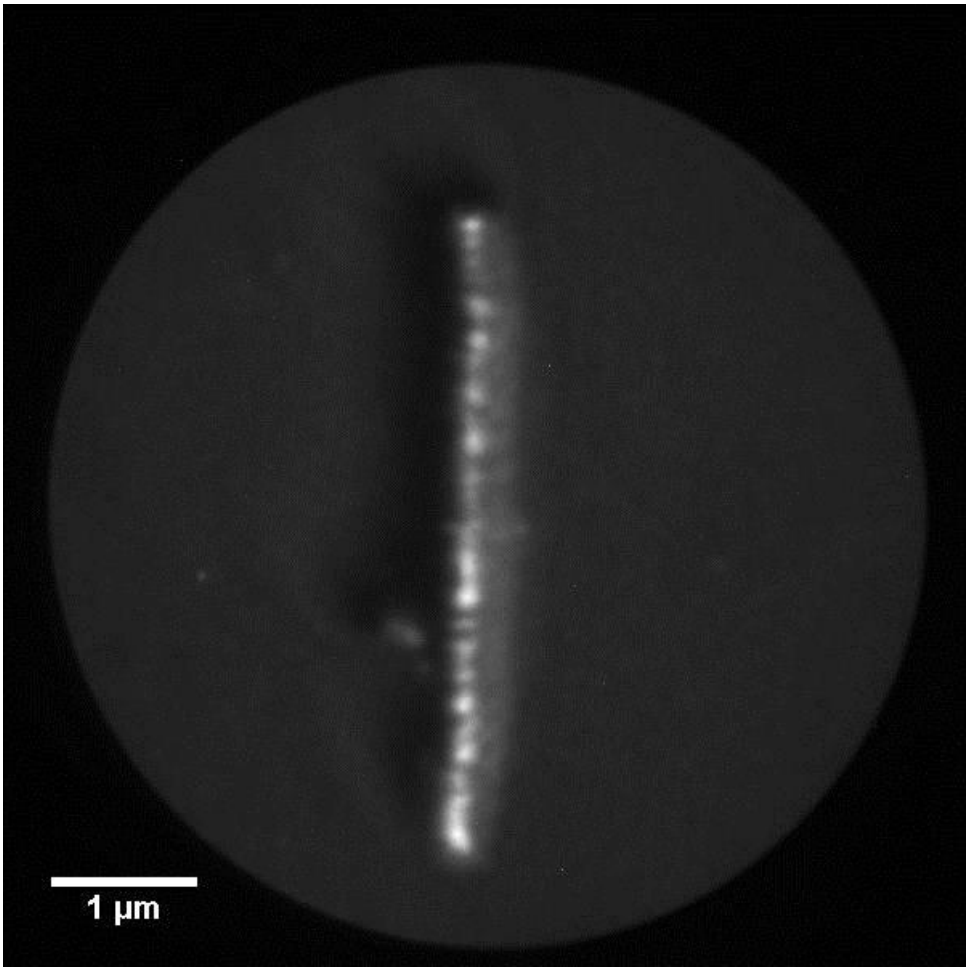


**Figure S4.** Ultraviolet photoemission electron micrograph (UV-PEEM) of an isolated NiCo / Cu wire of 200 nm diameter and with 200 nm segment length.

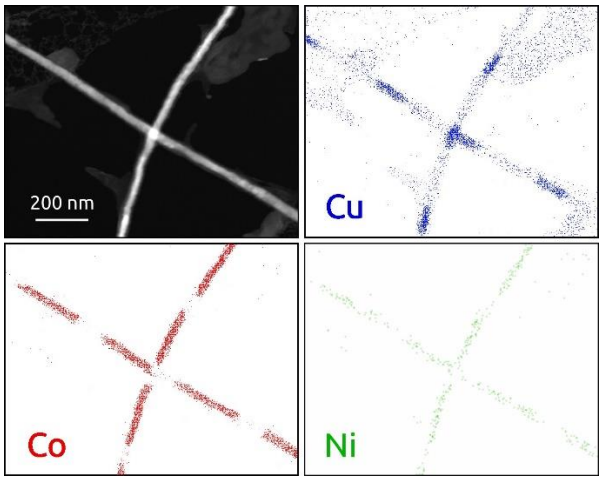


**Figure S5.** TEM-EDX analysis of two segmented NiCo / Cu wires crossed: The HAADF signal and the individual EDX signals are presented separately for each element. The color coding follows the sulfate salts…

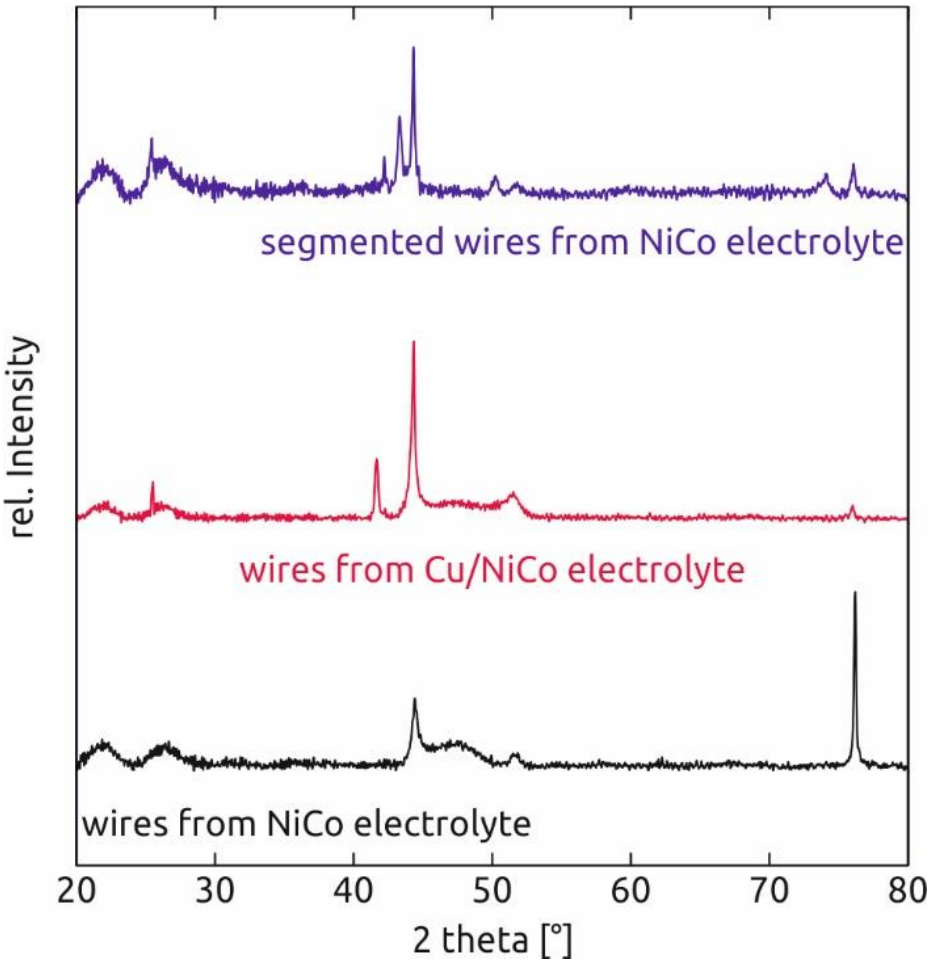


**Figure S6.** X-ray diffraction investigation of the origin of hcp-$Ni_{60}Co_{40}$ in segmented $Ni_{60}Co_{40}$ / Cu wires (blue line). $Ni_{60}Co_{40}$ wires grown from the binary electrolyte have the fcc crystal structure (black line), but $Ni_{60}Co_{40}$ wires grown from the ternary electrolyte already display the fcc peak at 41° (pink line). Thus, the mere presence of copper in the electrolyte suffices to change the crystal structure of the nickel-cobalt alloy deposited.