

# **Supporting Information for “Ni-Pt Multilayered Nanowire Arrays with Enhanced Coercivity and High Remanence Ratio”**

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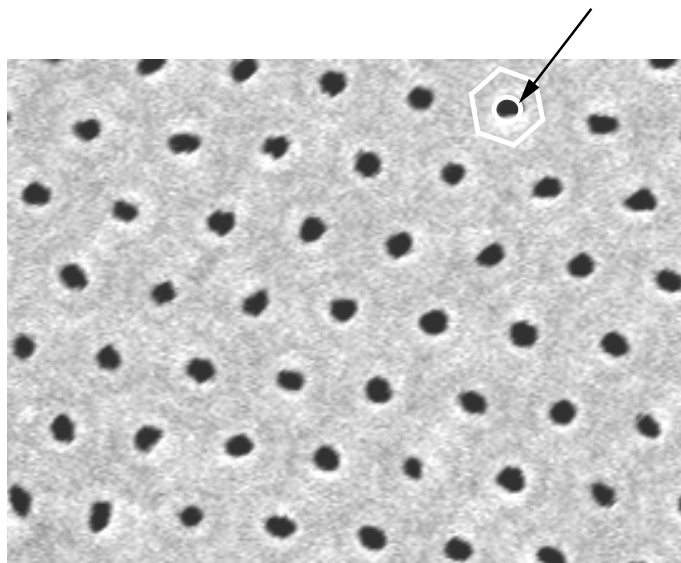
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## Detailed experimental procedure

AAO templates with the diameters of 20 nm and 50 nm were prepared by the procedure reported previously.<sup>9, 11</sup> Briefly, The AAO templates with pore sizes of about 50 nm were grown by potentiostatically anodizing aluminum plates (0.2 mm thick, 99.999%) in an aqueous solution of 5% oxalic acid under 40V at 3°C. The AAO templates with 20 nm diameter were grown by potentiostatically anodizing aluminum plates (0.2 mm thick, 99.999%) in an aqueous solution of 14% sulfur acid under 15 V at 3°C. After the anodization, the remaining aluminum was etched in a 20% HCl - 0.1 mol L<sup>-1</sup> CuCl<sub>2</sub> mixed solution. Then the barrier layer was dissolved in 5% phosphoric acid. Finally, a silver film was deposited by vacuum evaporation onto the surface of AAO template to serve as a conductive contact. AAO templates with different average diameters are characterized by SEM (JEOL JSM-6700F).

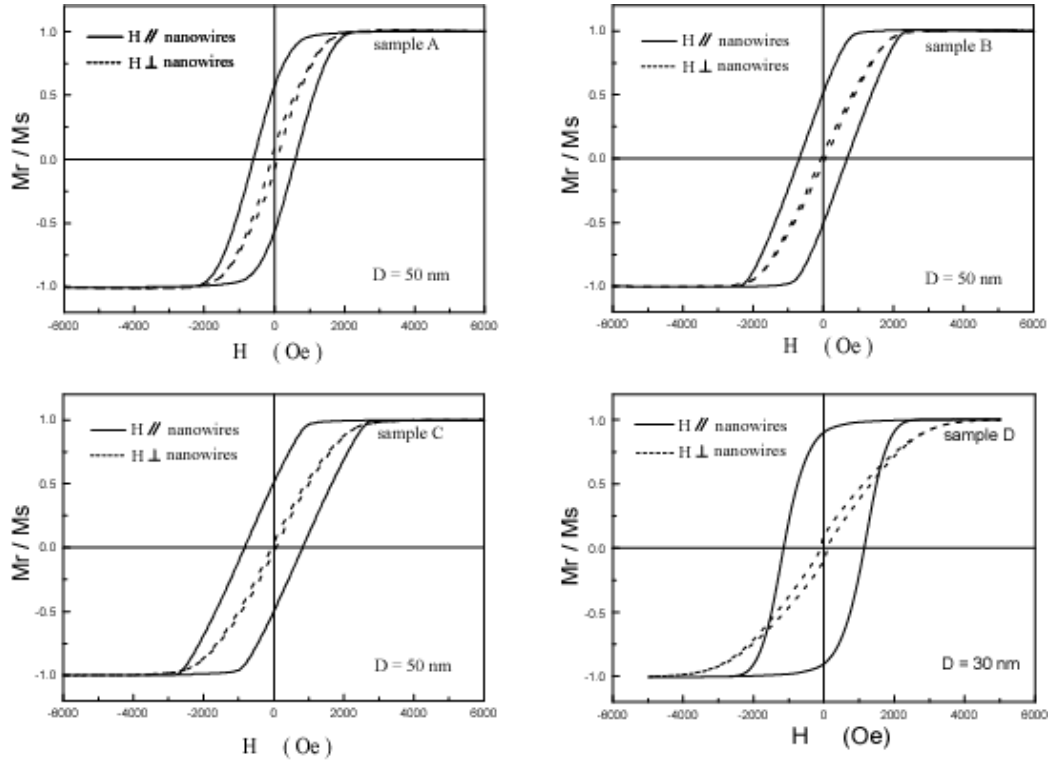
Cyclic voltammetry was carried out on EG&G instrument Princeton Applied Research (PAR) Basic Electrochemical System at room temperature. As a thin layer of Ag was evaporated onto one side of AAO template to serve as the cathode in a typical three-electrode electrochemical system, silver wire was used as the working electrode. A platinum plate and a saturated calomel electrode (SCE) are used as counter electrode and reference electrode, respectively. All electrode potentials are reported with respect to the SCE.

Ni-Pt multilayered nanowires were made from a single sulfate bath using potentiostatic control and a pulse deposition technique. The plating potential was alternately switched between a constant potential  $V_{Pt}$  of -0.28 V (vs. SCE) to deposit Pt only and a potential  $V_{Ni}$  of -1.3 V (vs. SCE) to get a majority of Ni. In pulse electrodeposition, AAO templates, a platinum plate and a saturated calomel electrode (SCE) are used as the working electrode, counter electrode and reference electrode, respectively. After liberating the Ni-Pt nanowires from their AAO matrix by dissolving the AAO template in 2 M NaOH at 25°C for 90 min, being ultrasonically dispersed in water, and dropping on TEM grids, we obtained the TEM images on a Philips TECNAI-20 transmission electron microscopy operated at 120 kV.



**Figure S1.** Top-view SEM images of AAO template with average diameter of 50 nm (a) and 30 nm (b)

## The hysteresis loops of sample A-D



**Figure S2.** The hysteresis loops of sample A-D embodied in AAO matrix with the magnetic field applied parallel ( $//$ ) and perpendicular ( $\perp$ ) to the axes of the nanowires at room temperature.