Supporting Information for:

Facile Synthesis and Assembly of Ag/NiO Nanofibers With High Electrical Conductivity

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Experimental Procedure

In a typical procedure for electrospinning, aqueous solution of poly (vinyl acetate) (PVA, Mw=80000) with a concentration of 10 wt% was first prepared from PVA beads and deionized water with vigorous stirring. 0.5 g of nickel nitrate ($Ni(NO_3)_2$, ≥99.8%) and 2.0 g of silver nitrate ($AgNO_3$, ≥99.8%) was then added into 2.5 g of PVA solution under stirring. All chemicals were obtained from Aldrich. The precursor solution was then delivered into a silver needle with an inner diameter of ~ 1mm at a constant flow rate of 1.0 ml/h by peristaltic pump. High-voltage of 20 kV was supplied at the silver needle by a dc power supply. A piece of grounded aluminum foil or silicon wafer was placed 20 cm below the tip of the needle to collect the nanofibers.

The collected fibers were then calcined at 500^{o}C in air for 2 hours to get Ag/NiO composite nanofibers. The heating rate was 10^{o}C/min.

For fiber assembly, two strips of conductive silicon stripes were attached to a glass plate and used as the negative electrode. The high-voltage supply was fixed as 20 kV, and the collecting distance remained 20 cm.

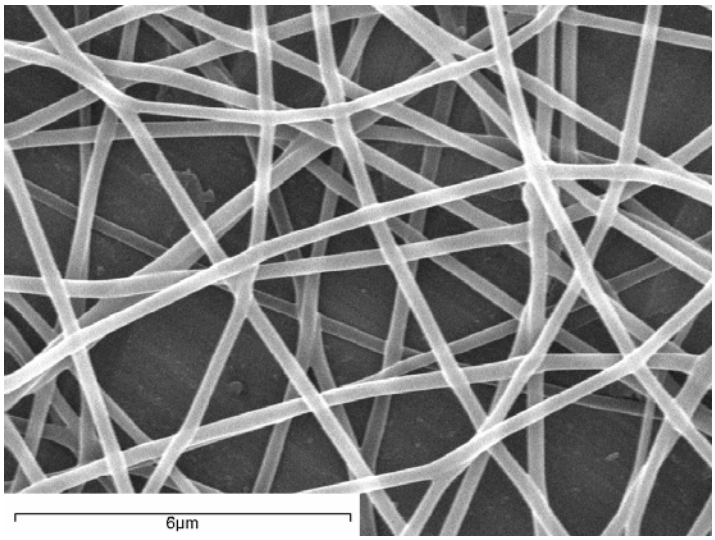

Figure 1: SEM image of randomly oriented fibers electrospun from a solution containing PVA, $AgNO_3$ and $Ni(NO_3)_2$. The fibers are collected on an aluminum foil.

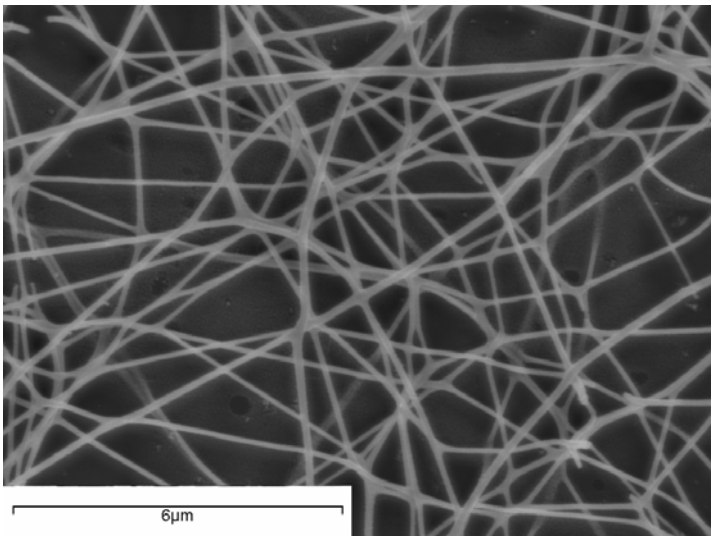

Figure 2: SEM image of Ag/NiO composite nanofibers, prepared by calcination of the precursor fibers at 500 ^{o}C for 2 hours. The fibers remained continuous after calcinations, with a uniform morphology.

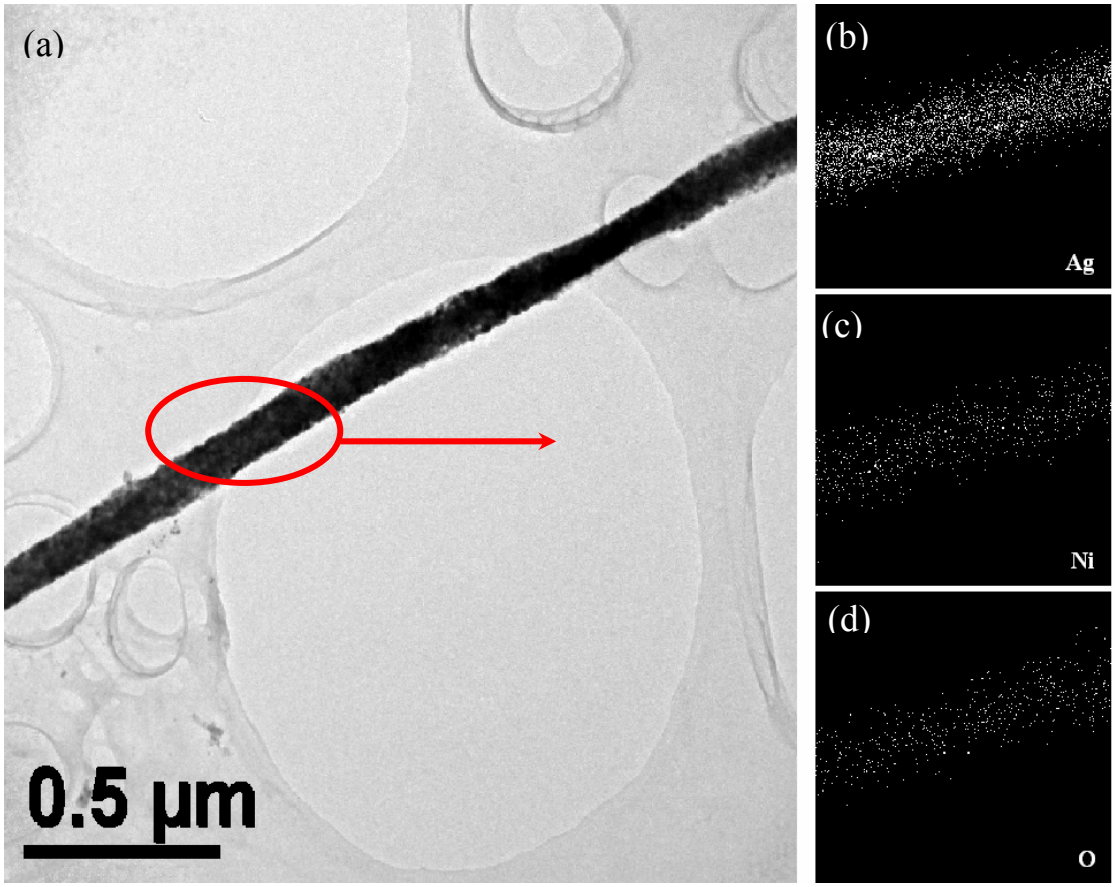

Figure 3: Low-magnification TEM image (a) and elemental maps of synthesized Ag/NiO composite nanofiber: (b) Ag map; (c) Ni map; (d) O map.

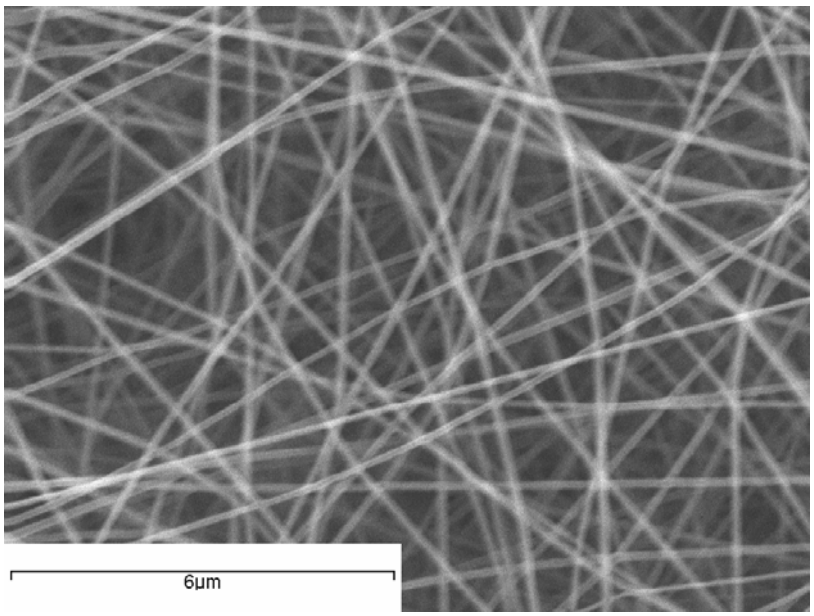

Figure 4: SEM image of PVA/$AgNO_3$ composite nanofibers without the addition of $Ni(NO_3)_2$. The fibers were electrospun from an aqueous solution containing 6.0 wt% of PVA and 40.0 wt% of $AgNO_3$.

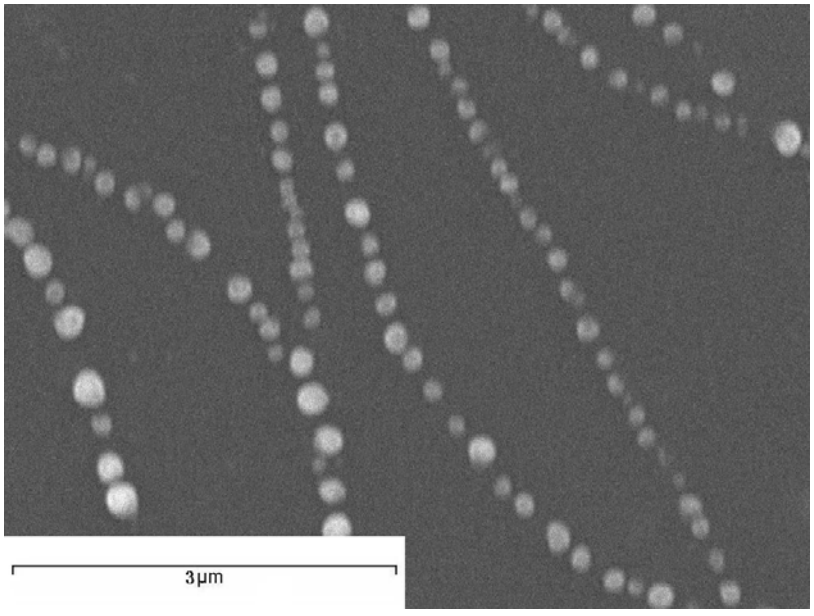

Figure 5: SEM image of the products after calcination of PVA/$AgNO_3$ composite nanofibers at 500 ^oC for 2 hours. Lines of separated silver nanoparticles instead of continuous nanofibers were observed after the heating process.