Supporting Information

Large-scale metal nanoelectrode array based on printed nanowire lithography for nanowire complementary inverters

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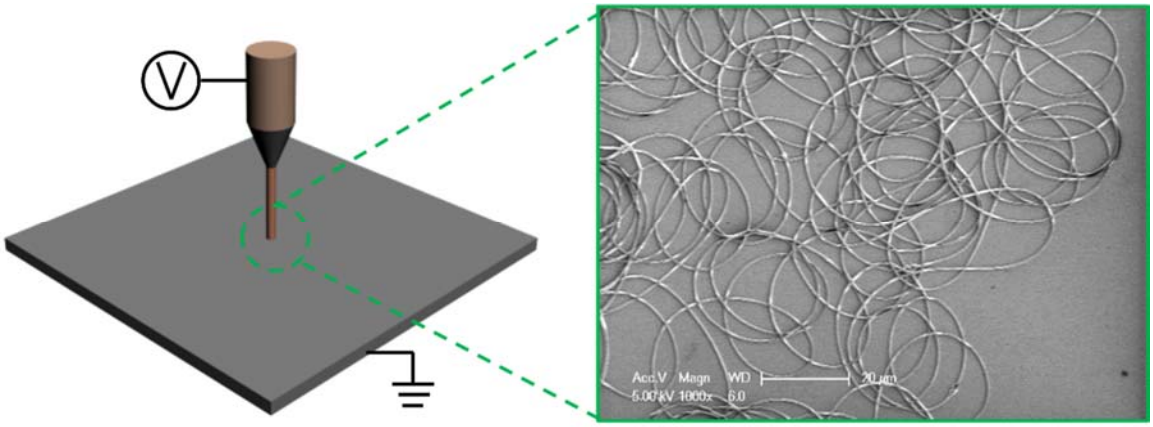

Fig. S1 Local spiraling caused by a repulsive force among positively-charged NWs during E-NP, which uses a high electric field within a short distance of a nozzle tip and a grounded substrate.

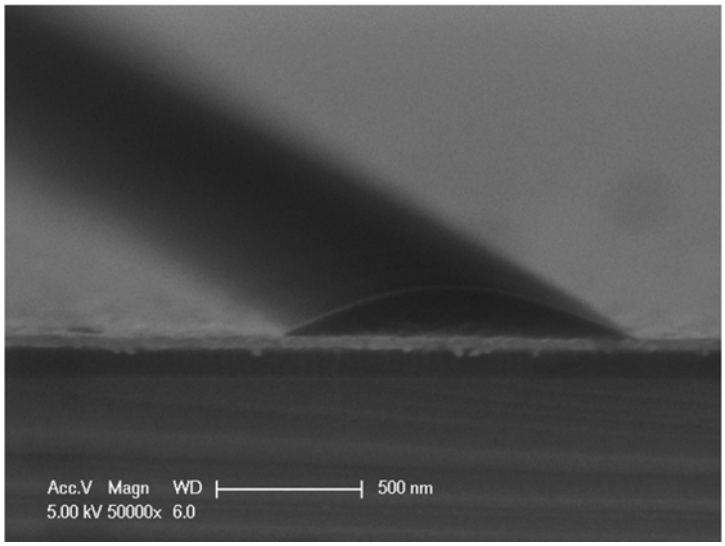

Fig. S2 SEM image of cross section of a collapsed PVDF-TrFE NW after annealing at 45 °C for 60 min with THF vapor (width ~ 1.2 μm).

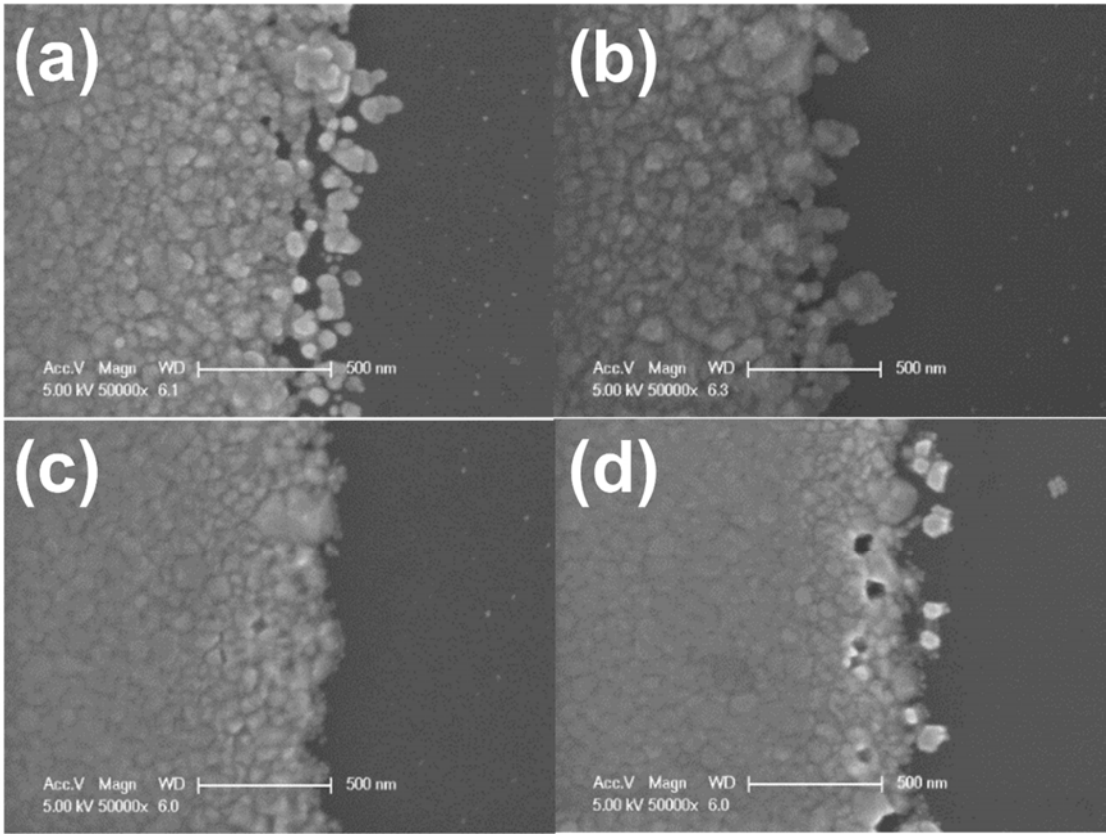

Fig. S3 Boundary morphology of AgNEs depending on etchant concentration. SEM images of edges of AgNEs using different etchant mixture ratio of NH_4OH: H_2O_2:CH_3OH = (a) 1:1:1, (b) 1:1:0.5, (c) 1:1:0.25, and (d) 1:1:0.

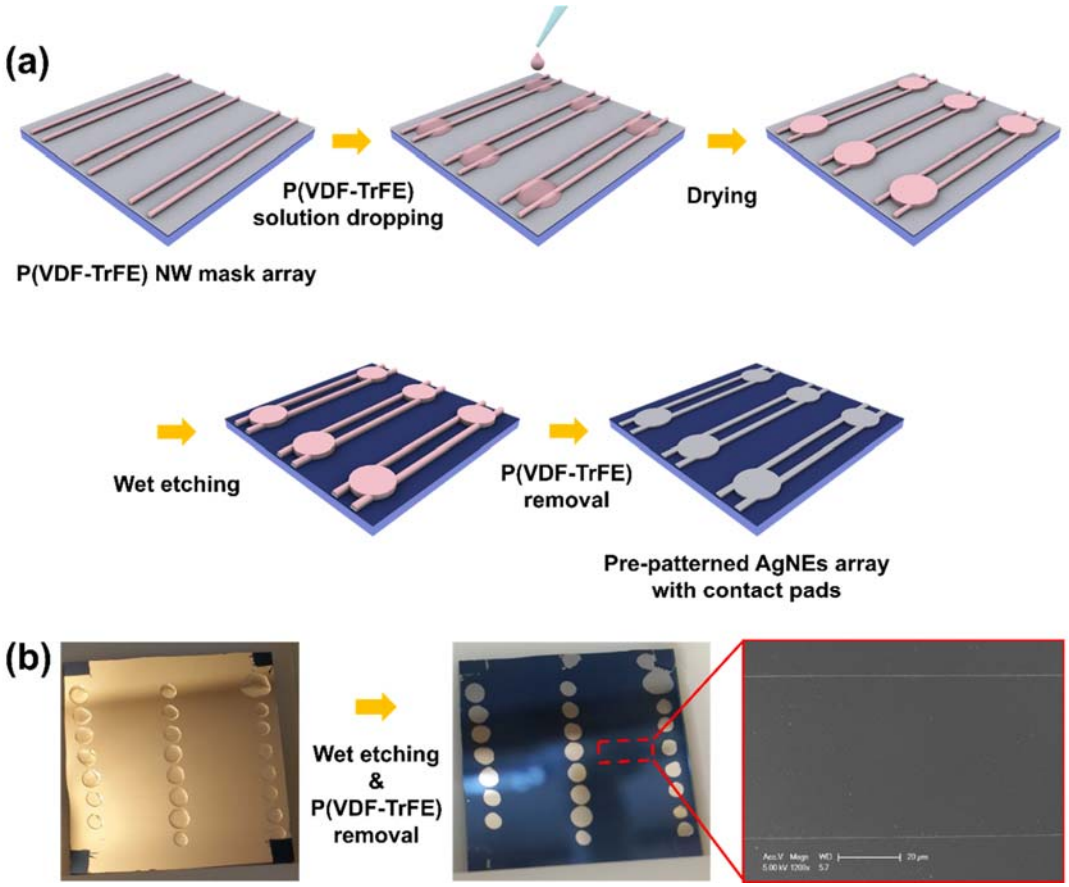

Fig. S4 Fabrication of pre-patterned AgNEs array with contact pads. (a) Schematic description and (b) digital and SEM images of fabrication procedures of pre-patterned AgNEs array with contact pads using PVDF-TrFE NW masks and PVDF-TrFE solution dropping.

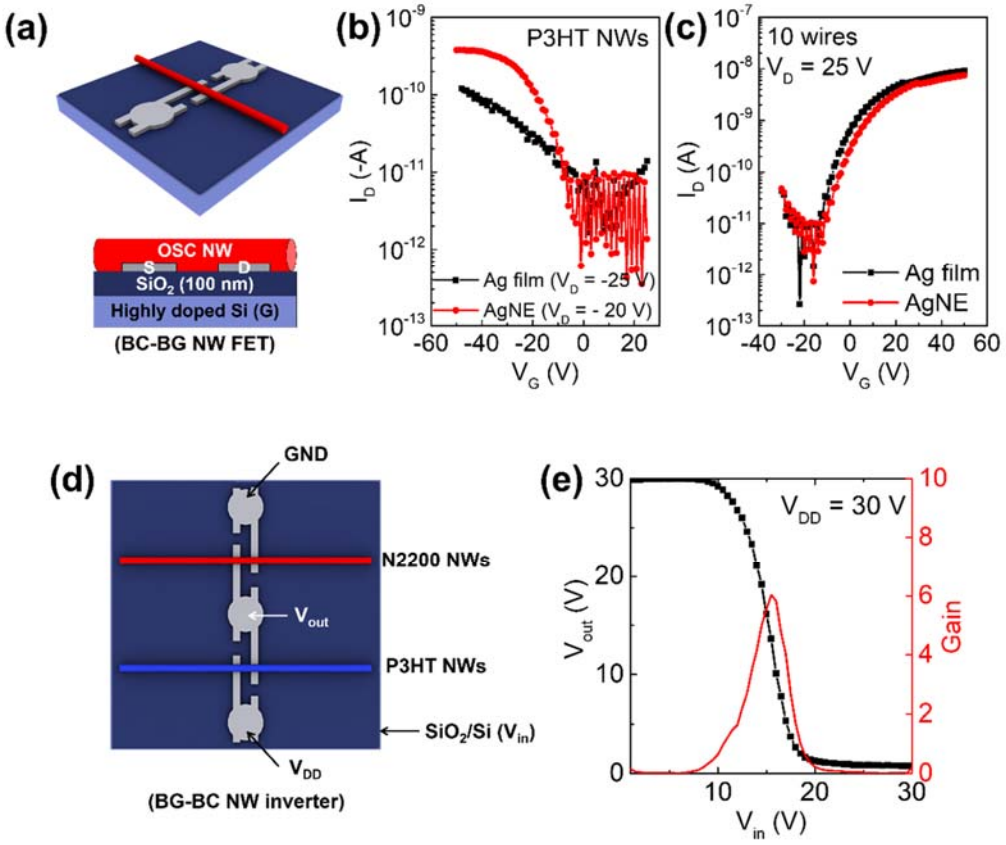

Fig. S5 Characteristics of BG-BC geometric NW FETs and inverter. (a) Specific device structure of NW FET. Transfer characteristics of NW FETs with (b) p-type P3HT and (c) n-type N2200 NWs compared to control devices with Ag film electrodes. Each FET was composed of 10 strands of OSC NWs. (d) Specific device structure of NW inverter. (e) VTC and voltage gain characteristic of NW complementary inverters composed of 100 strands of P3HT NWs, 10 strands of N2200 NWs, and AgNEs.

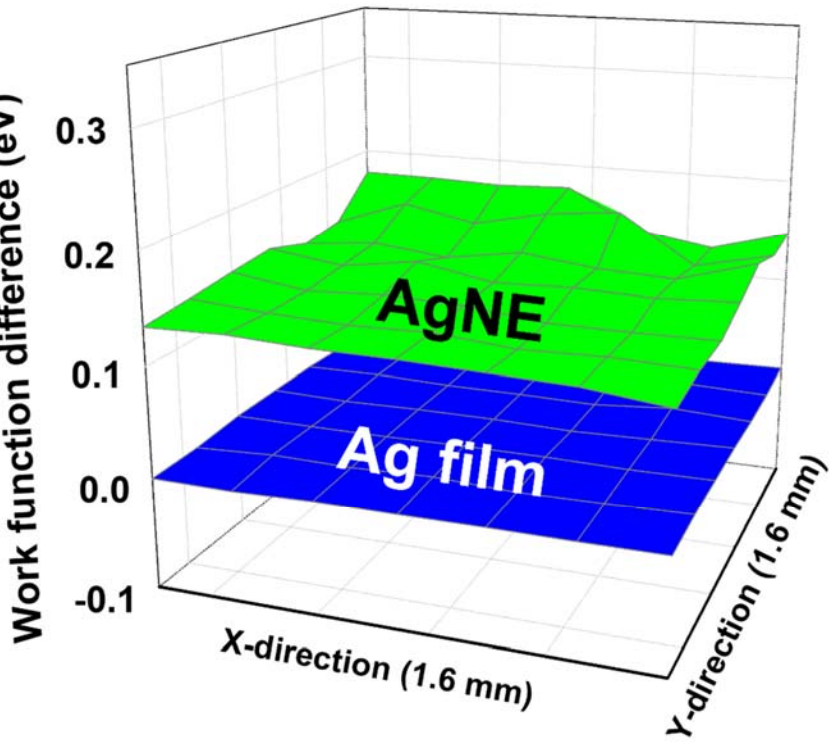

Fig. S6 Work functions difference between AgNE and Ag film. AgNE has higher work function than Ag film due to surface oxidation caused during wet etching.