Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A.

Energy-dense wire-like supercapacitors based on scalable three-dimensional porous metal-graphene oxide skeleton electrodes

Ruitao Zhou, Kwok-ho Lam*

Supporting Information

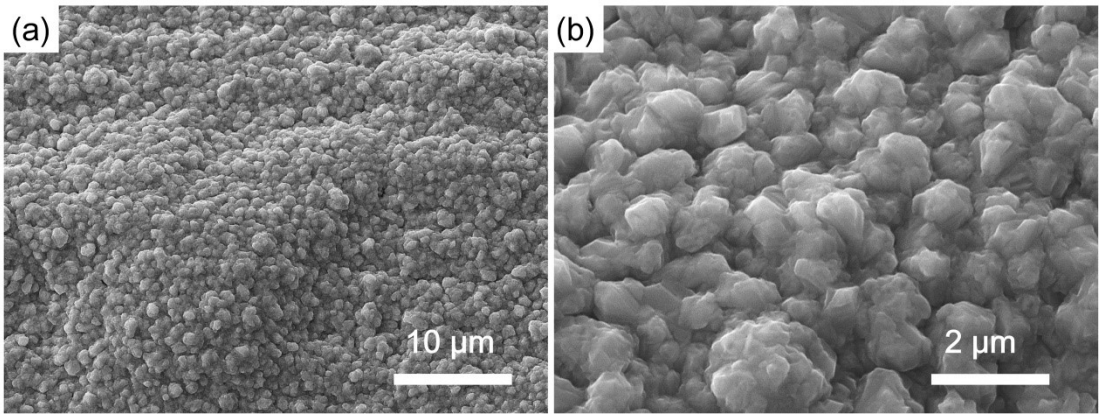

Figure S1 SEM images of Ni wire after deposition of Cu for 3 h at the condition of strong agitation ((a) with low magnification, (b) with high magnification).

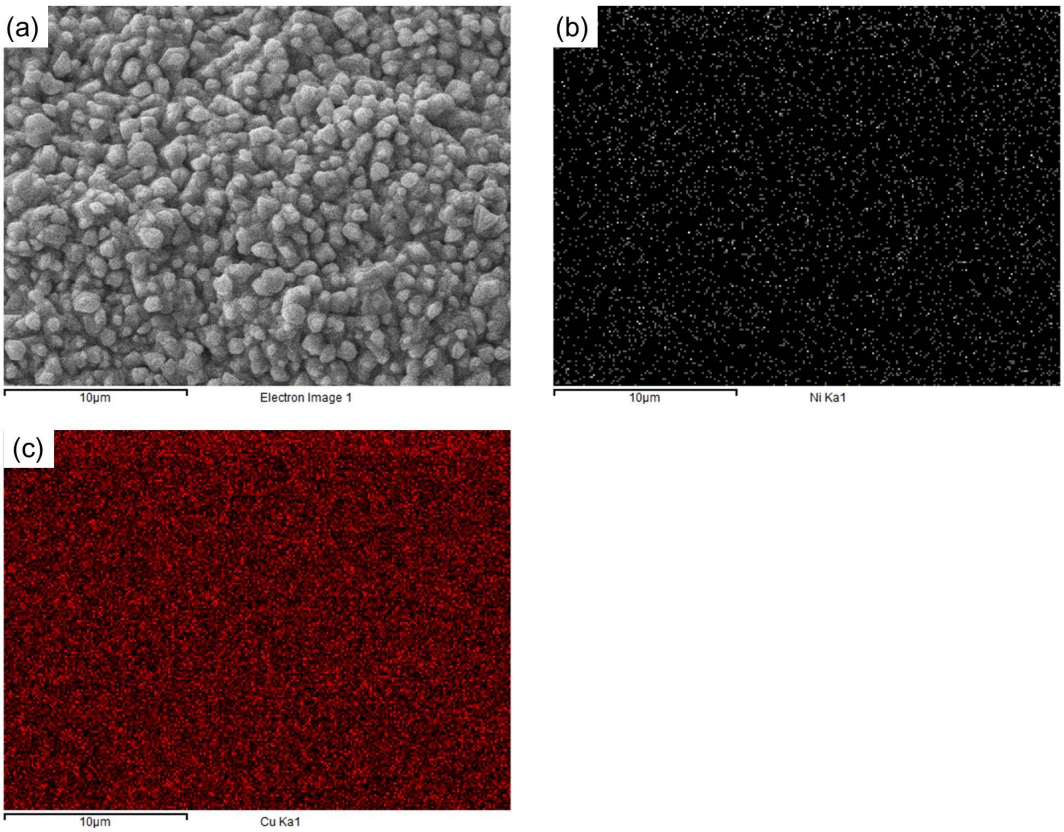

Figure S2 SEM image (a) and EDX mapping images of Ni (b) and Cu (c).

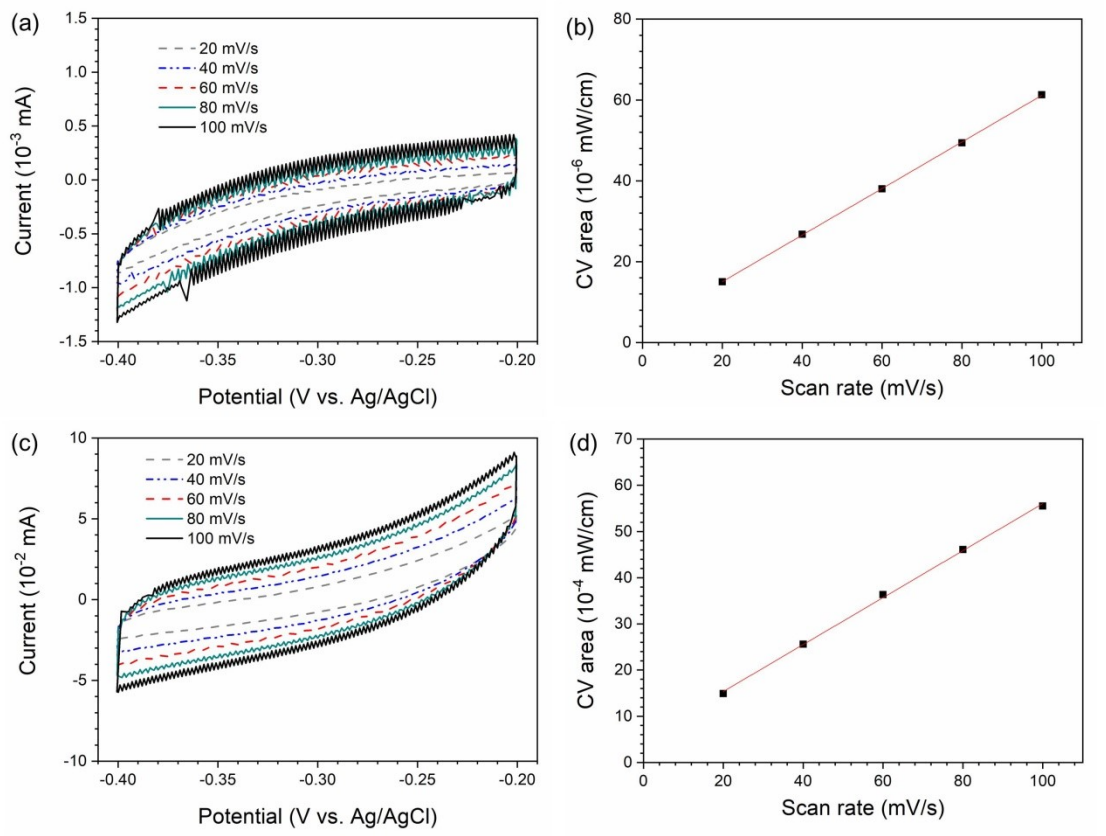

Figure S3 CV curves and areas of different Ni electrodes with the potential window of 0.2 V in 0.5 M Na_2SO_4 electrolyte: (a, b) pristine Ni wire and (c, d) Ni-GO@Ni wire.

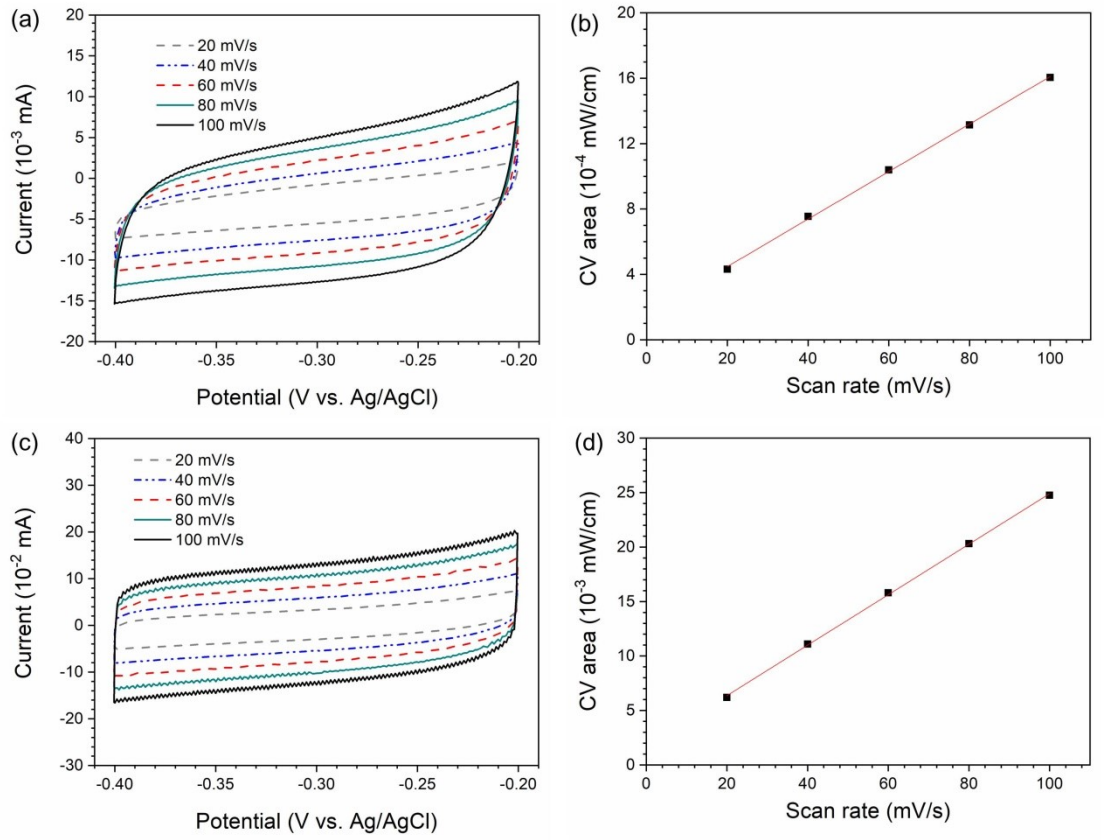

Figure S4 CV curves and areas of different Cu electrodes with the potential window of 0.2 V in 0.5 M Na_2SO_4 electrolyte: (a, b) Cu@Ni wire and (c, d) Cu@Ni-GO@Ni wire.

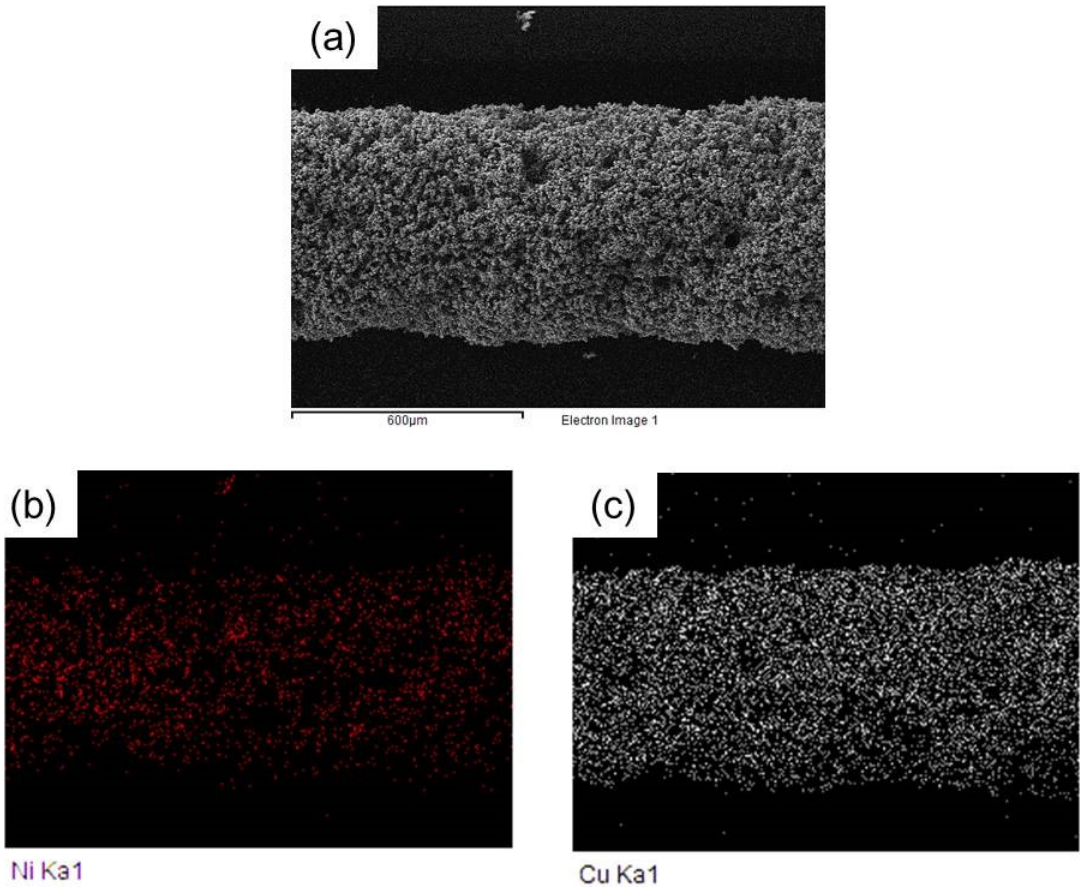

Figure S5 SEM image (a) and EDX mapping images of Ni (b) and Cu (c) for the Cu@Ni-GO@Ni wire.

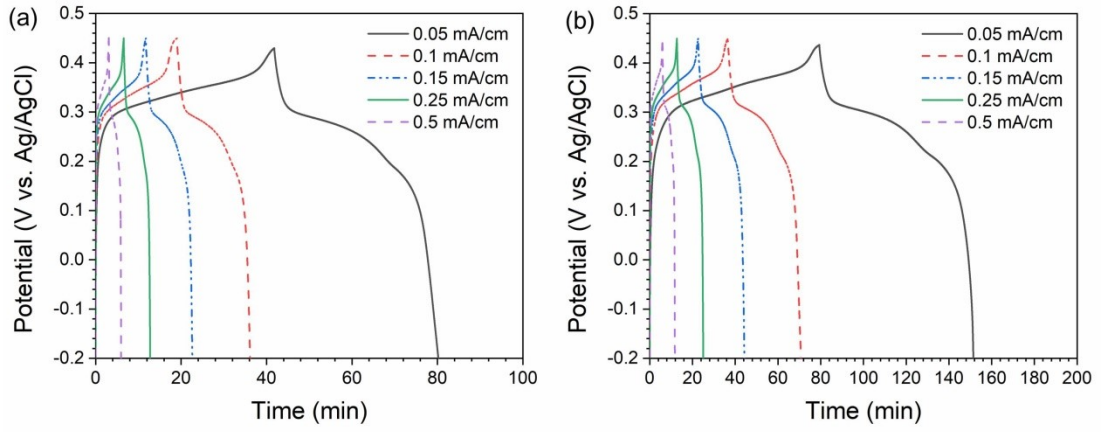

Figure S6 GCD curves of Ni-GO@Ni wire electrodes using Ni wires with different diameters: (a) 0.1 mm and (b) 0.05 mm.

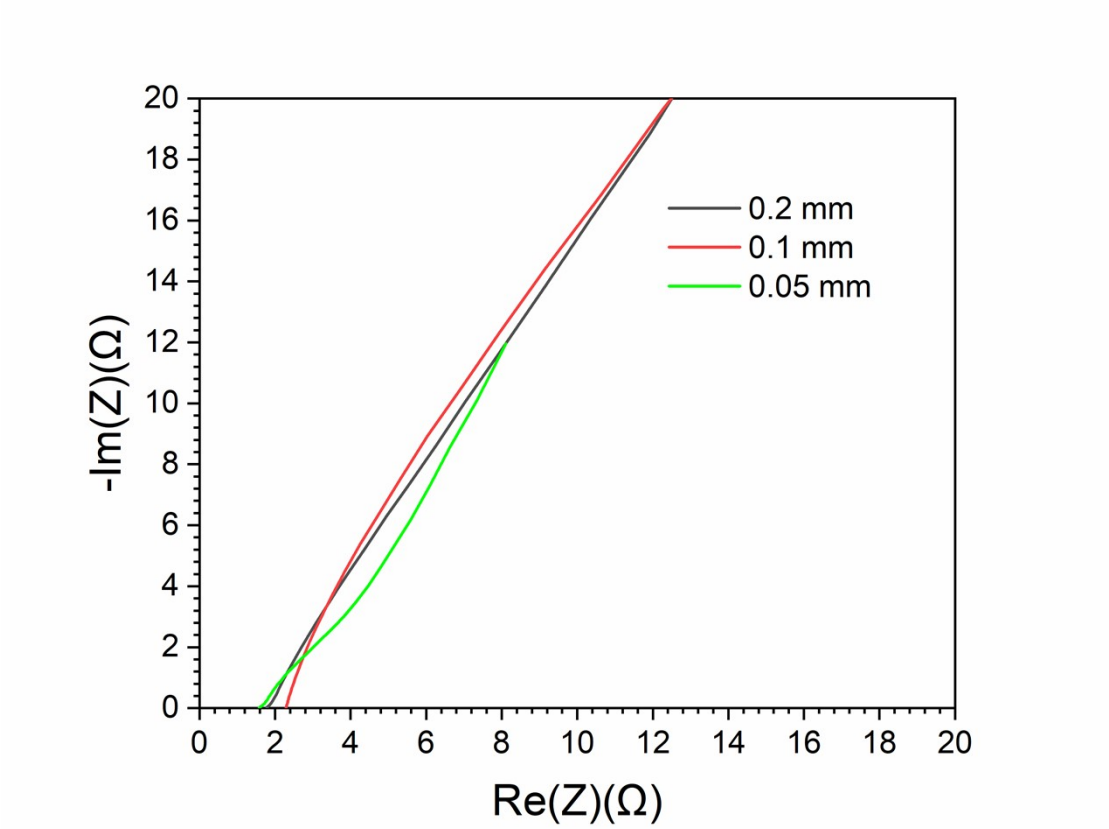

Figure S7 EIS curves of NiGO@NiW electrodes using Ni wires with different diameters.

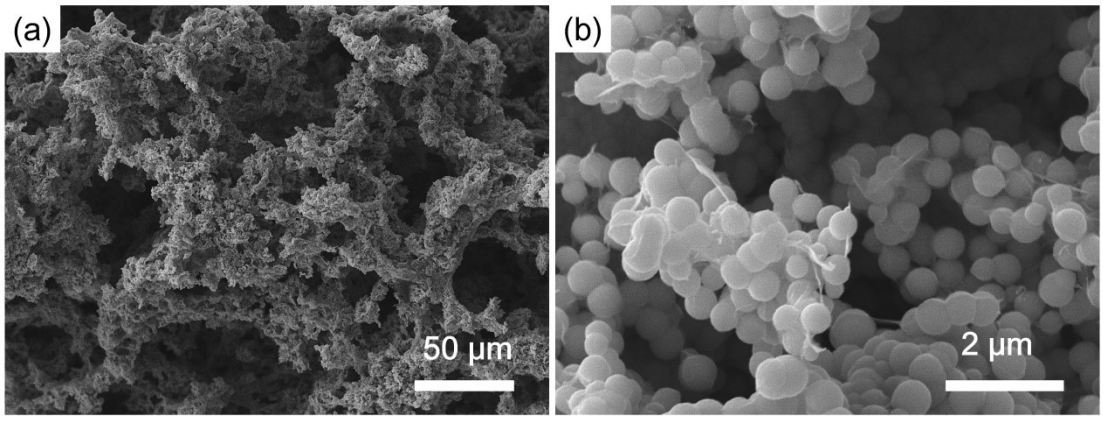

Figure S8 SEM images of Ni-GO@NiW electrode synthesized in the plating solution with the pH values of 8.0 ((a) at low magnification, (b) at high magnification).

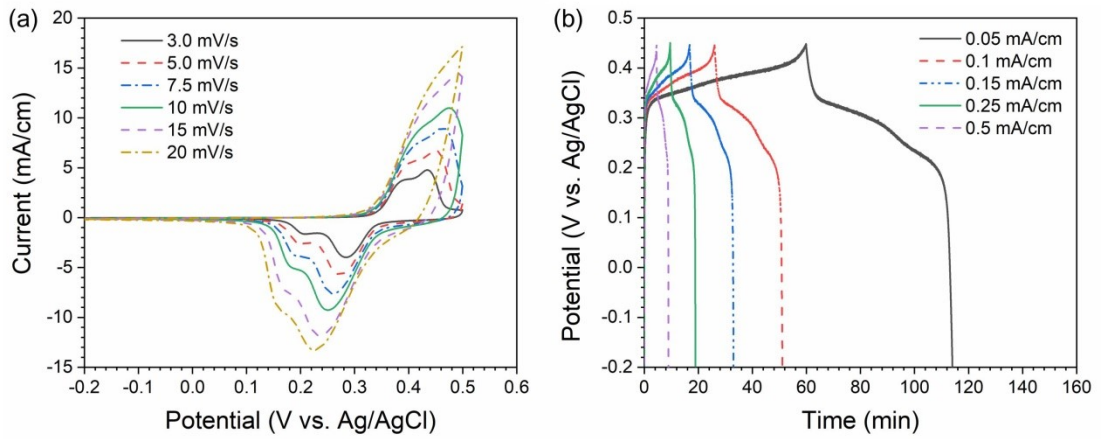

Figure S9 (a) CV curves and (b) GCD curves of Ni-GO@NiW electrode synthesized in the plating solution with the pH value of 8.0.

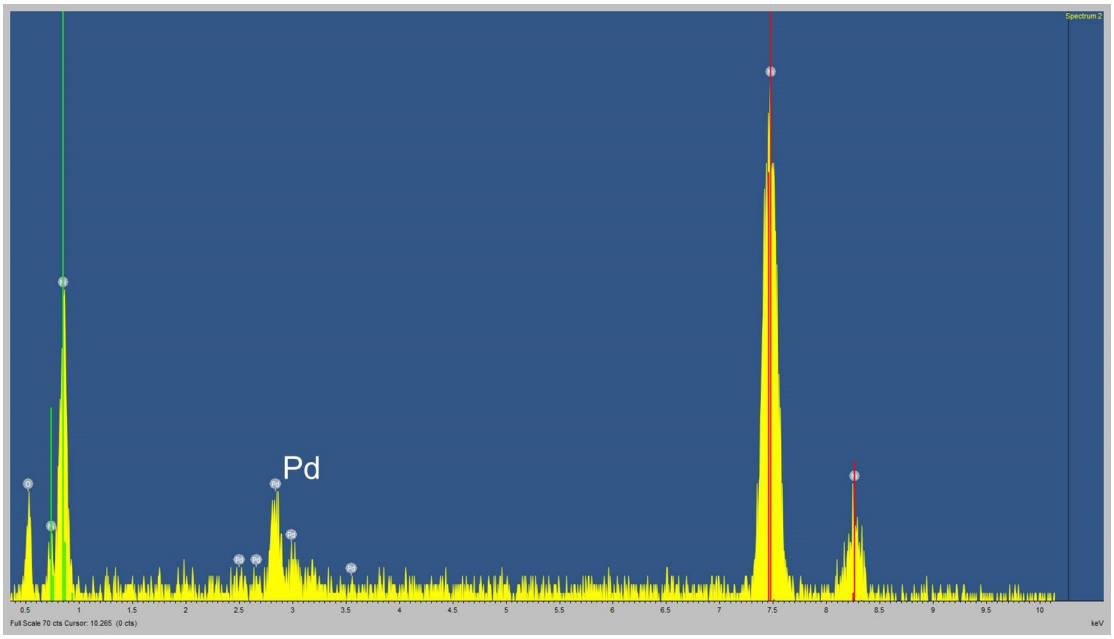

Figure S10 EDX spectroscopy of Ni-GO@NiW electrode after the treatment in 20 ppm $PdCl_2$ for 1 h.

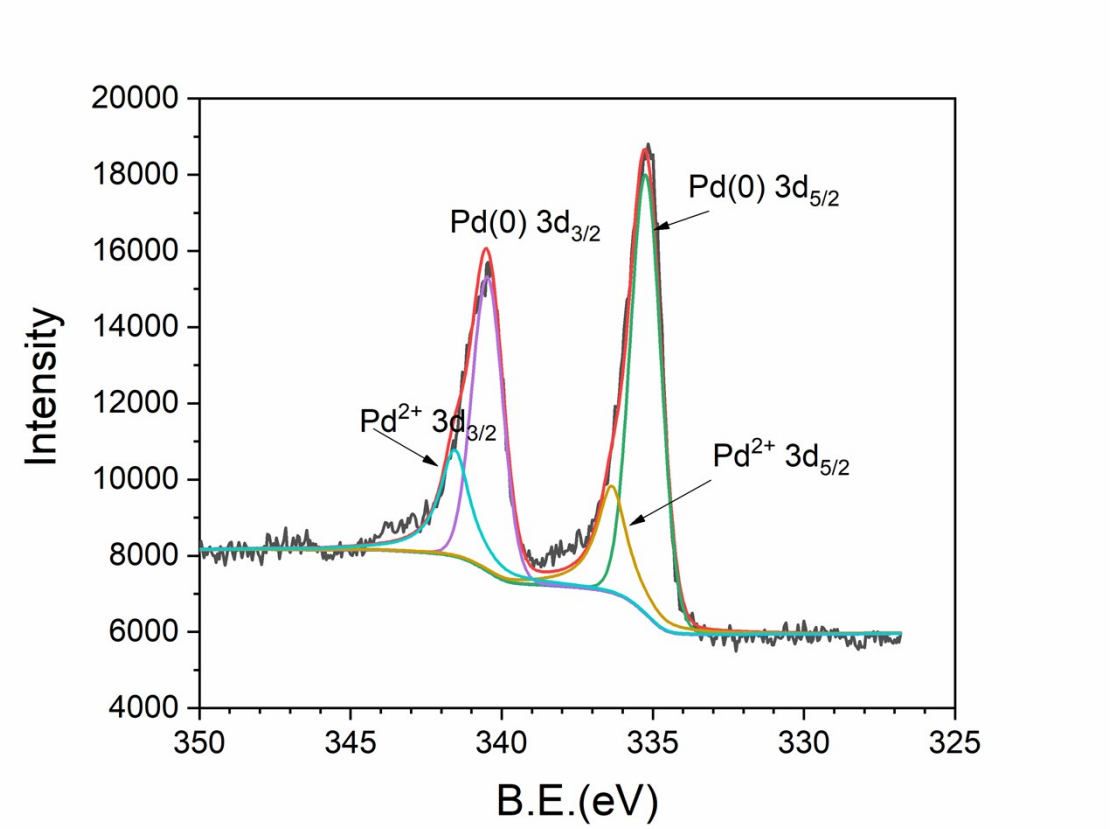

Figure S11 XPS spectra of Ni-GO@NiW electrode after the treatment in 20 ppm $PdCl_2$ for 1 h.

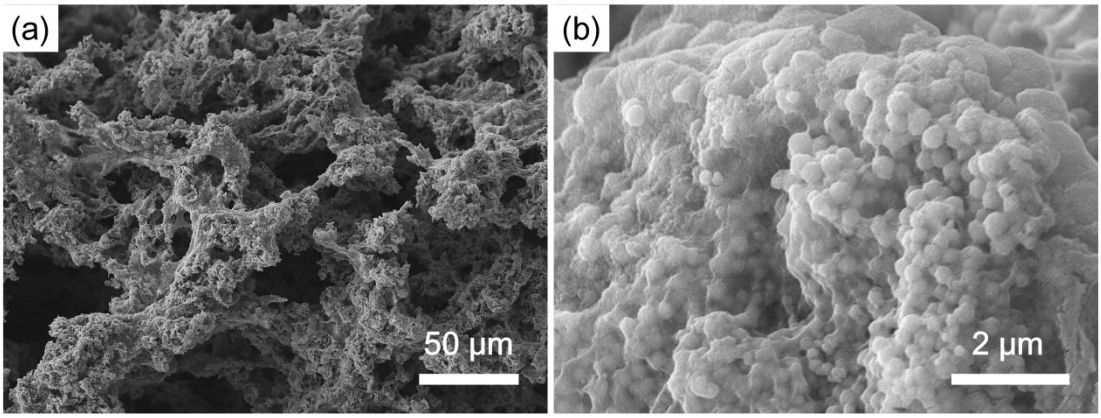

Figure S12 SEM images of Ni-GO@NiW electrode after the treatment in 20 ppm $PdCl_2$ for 1 h.

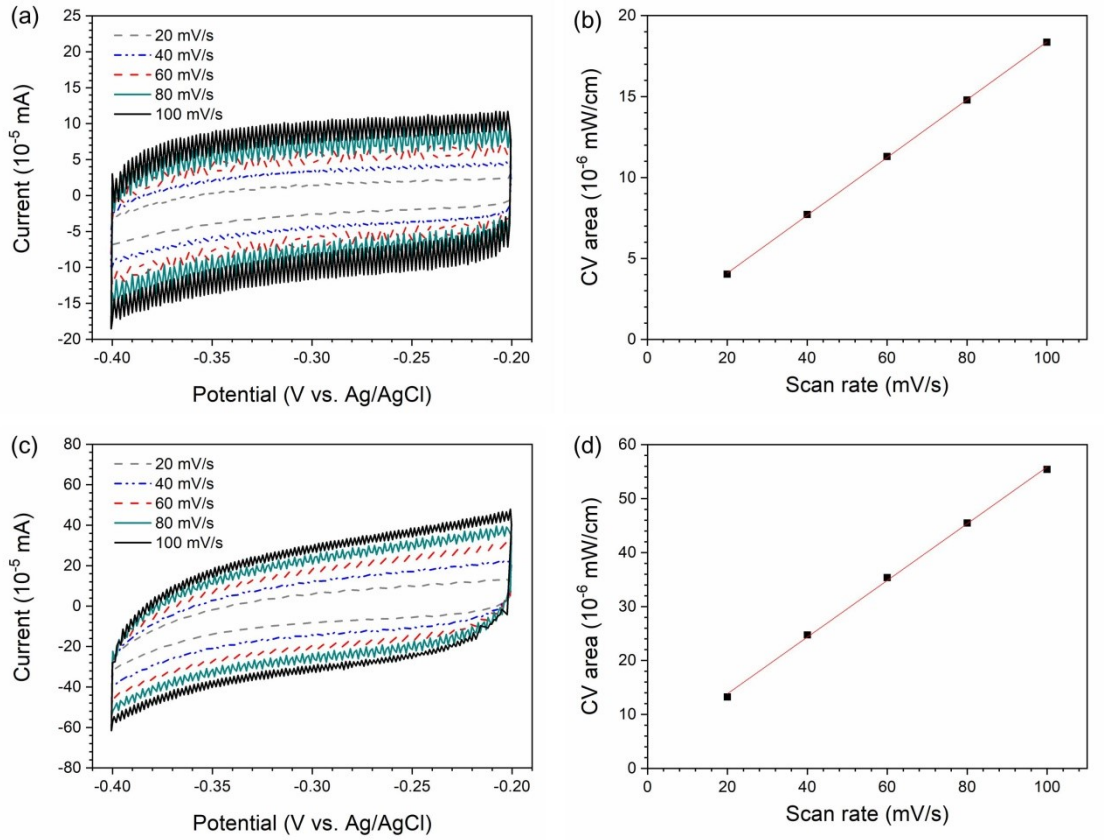

Figure S13 CV curves and areas of 0.1 mm-diameter Ni wires (a, b) before and (c, d) after the treatment in 20 ppm $PdCl_2$ for 1 h with the potential window of 0.2 V in 0.5 M Na_2SO_4 electrolyte.

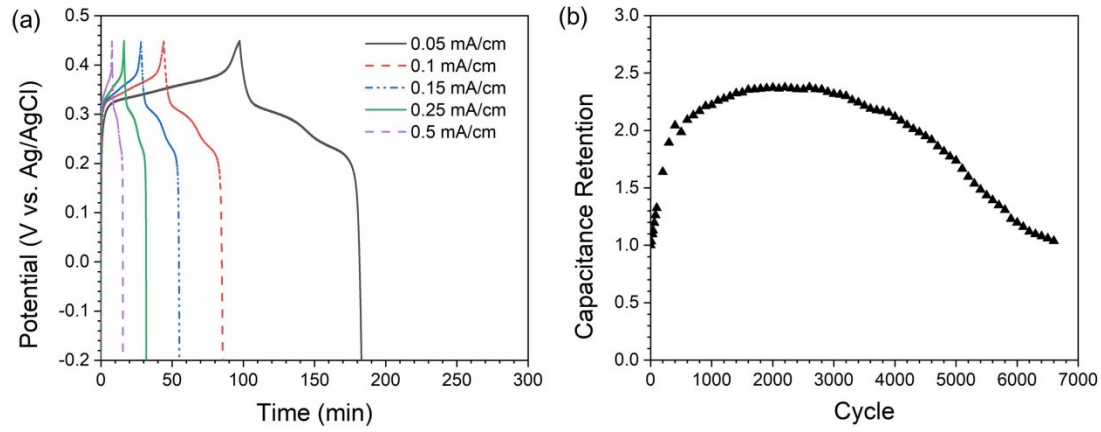

Figure S14 (a) GCD curves and (b) long cycle test result of Ni-GO@NiW electrode after the treatment in 20 ppm $PdCl_2$ for 1 h.

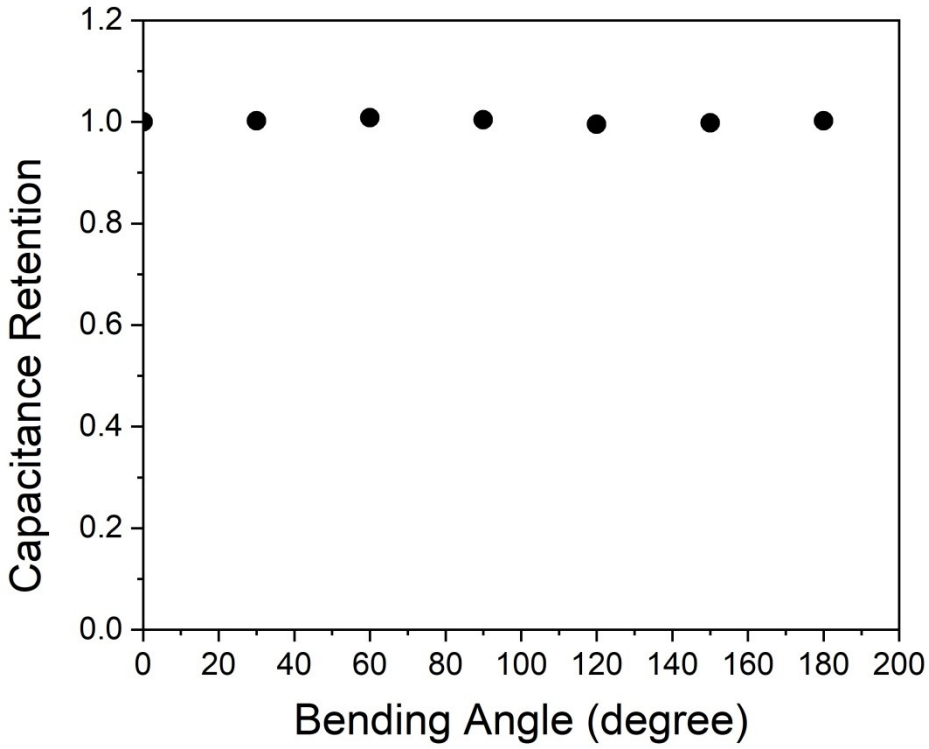

Figure S15 Bending test result of $Ni(OH)_2$@Ni-GO@NiW//Cu@Ni-GO@NiW supercapacitor against bending angles.

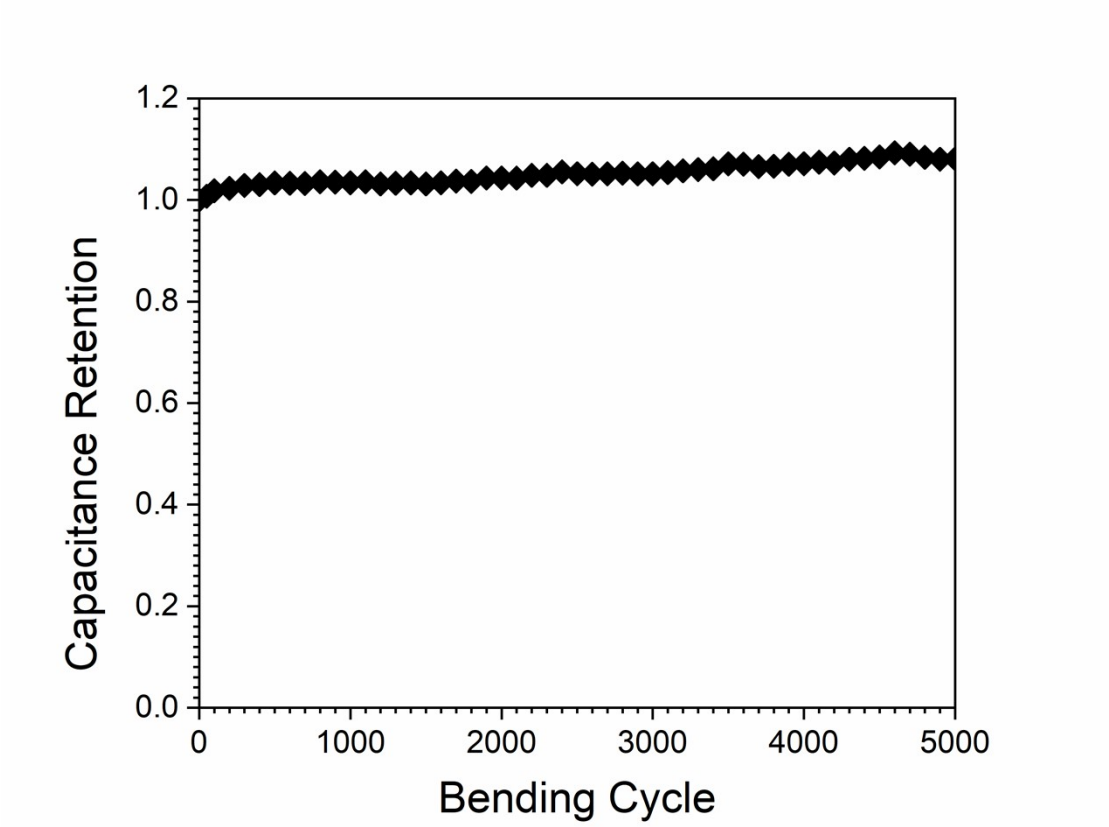

Figure S16 Bending test result of $Ni(OH)_2$@Ni-GO@NiW//Cu@Ni-GO@NiW supercapacitor with a large radius of curvature (1.5 cm) against bending cycles.

Movie: the process of the growth of the 3D porous electrodes:
https://youtu.be/DgaPBtiMNDk