[**Supporting Information**]

One-step fabrication of silver nanosphere-wetted carbon nanotube electrodes via electric-field-driven combustion wave for high-performance flexible supercapacitors

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Keywords: combustion; supercapacitor; silver/silver oxides; carbon nanotubes; wetted hybrids; chemical synthesis

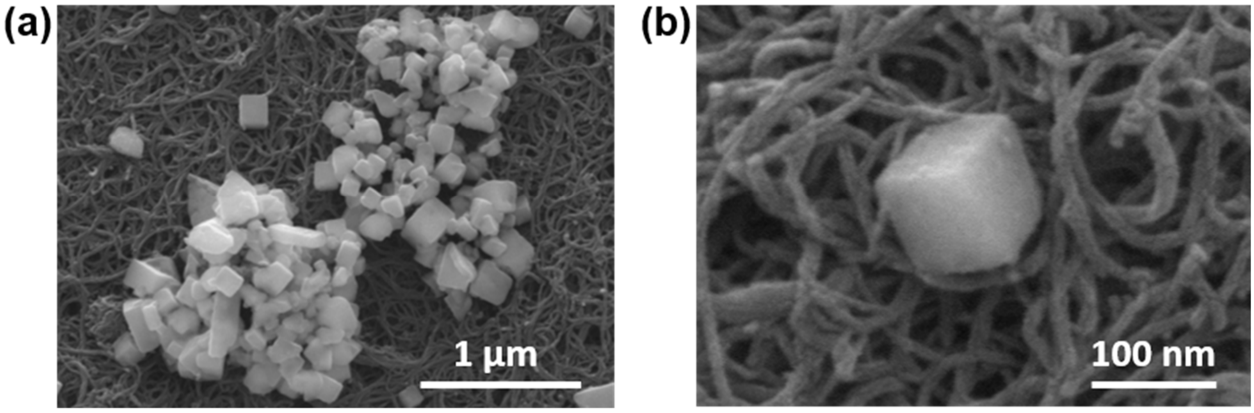

Fig. S1. Hybrid structures of Ag_2O/Ag and MWCNTs before the application of E-CWs. Scanning electron microscopy (SEM) images of **(a)** as-prepared Ag_2O/MWCNTs and (b) interfacial contacts between Ag_2O and MWCNTs before the application of E-CWs

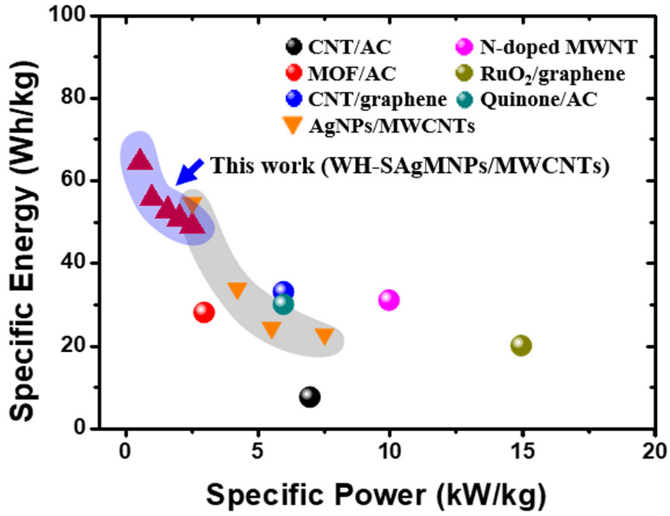

Fig. S2. Ragone plots of the specific energy and power of flexible all-solid-state symmetric supercapacitors based on WH-SAgMNPs/MWCNTs electrodes with different hybrid electrodes of metal oxides and carbon-based materials.[1, 2] The specific energy and power density reported in this work were obtained from the full-cell of WH-SAgMNPs/MWCNTs electrode/gel-type electrolyte/ WH-SAgMNPs/MWCNTs electrode fabricated by 150 V E-CWs.

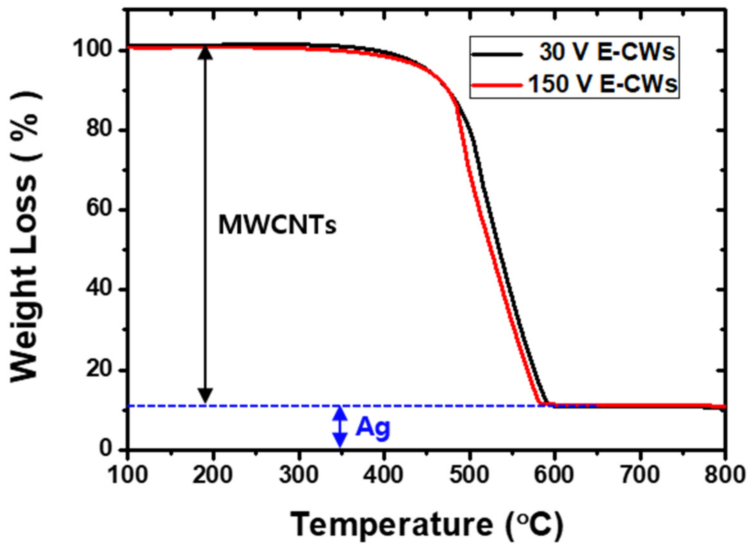

Fig. S3. Thermogravimetric analysis (TGA) of hybrids of AgMNPs/MWCNTs, fabricated by 30 V and 150 V E-CWs.

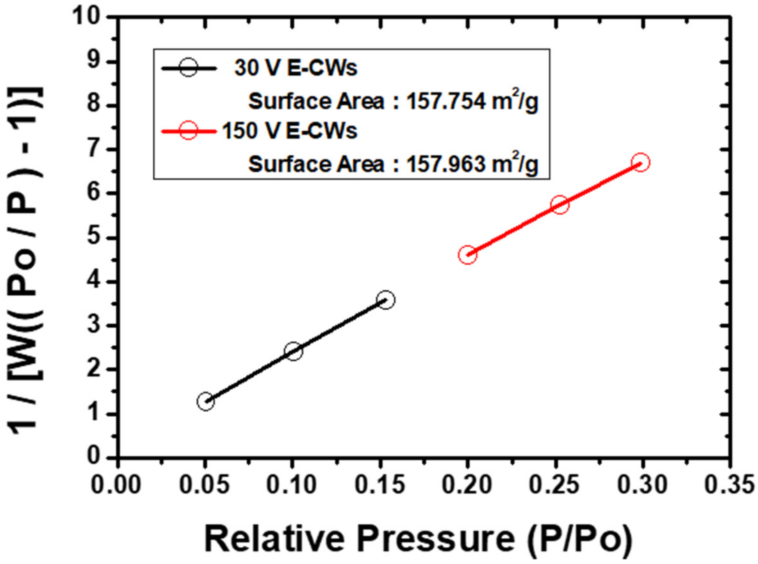

Fig. S4. **BET (Brunauer–Emmett–Teller) specific surface areas of hybrids of AgMNPs/MWCNTs, fabricated by 30 V and 150 V E-CWs.**

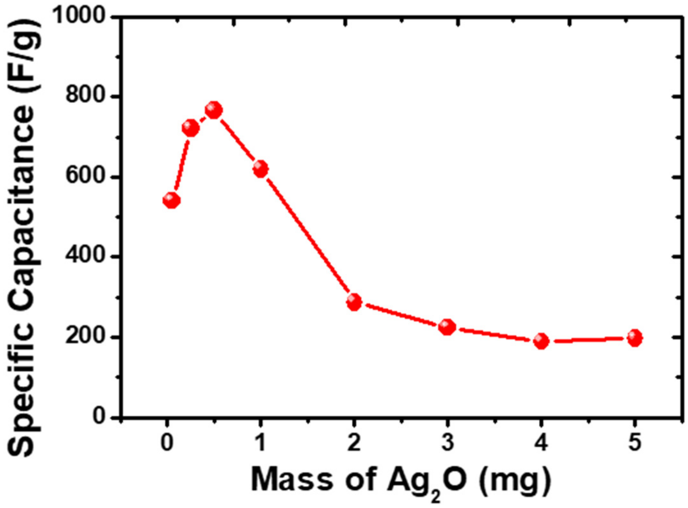

Fig. S5. Maximum specific capacitances of WH-SAgMNPs/MWCNTs electrodes in different mass of Ag_2O (0.05, 0.25, 0.5, 1, 2, 3, 4 and 5 mg) at the scan rate of 10 mV/s. The mass of the MWCNTs was 20 mg.

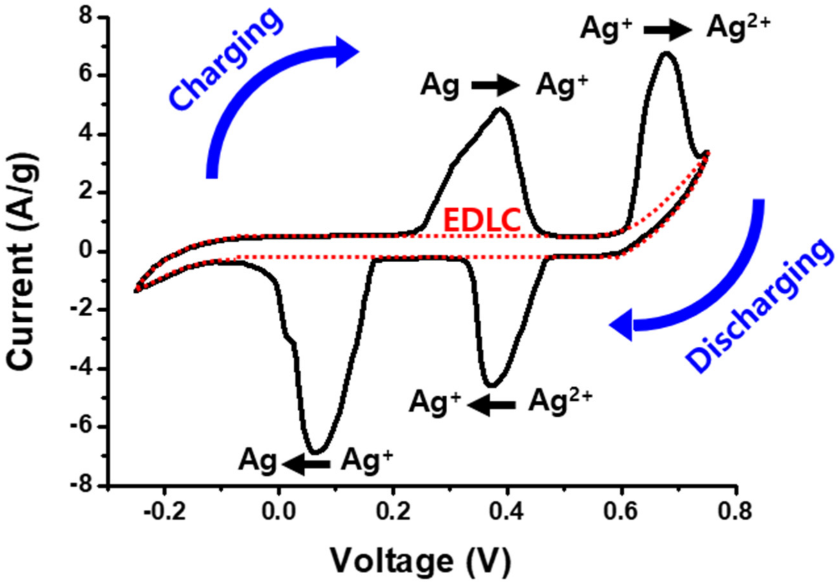

Fig. S6. Classification of dominant charge-discharge mechanisms in CV curves of WH-SAgMNPs/MWCNTs electrodes.

Ragone plots for flexible all-solid-state symmetric supercapacitors based on the WH-SAgMNPs/MWCNTs electrodes

The Ragone plots for flexible all-solid-state symmetric supercapacitors based on the WH-SAgMNPs/MWCNTs electrodes show the overall comparison of the energy storage performances of different hybrid electrodes of metal/metal oxides and carbon-based materials, in terms of specific energy and power density (**Fig. S2**).[1, 2] The specific energy and power density reported in this work were obtained from the full-cell of the WH-SAgMNPs/MWCNTs electrode/gel-type electrolyte/WH-SAgMNPs/MWCNTs electrode fabricated by 150 V E-CWs. The specific energy (~64.5 Wh/kg) and areal energy density (~8.39 μWh/cm^2) were much higher than other full-cells using hybrid electrodes composed of other metal/metal oxides/carbon-based materials, while the specific power exhibited moderate performance compared to the others, owing to the relatively slow charge-discharge rates of the metallic electrodes. Because the electrochemical reactions of the WH-SAgMNPs/MWCNTs electrode mainly use the redox reaction of Ag in the metallic supercapacitors, one charge-discharge cycle intrinsically requires more time than metal oxide-based supercapacitors (**Fig. S6**). However, the obtained specific energy from the H-Ag/MWCNTs fabricated by E-CWs significantly surpasses other supercapacitors. These characteristics imply that the metallic supercapacitor takes a long time for charging at certain voltages and discharging in the constant currents. This outstanding specific energy and comparable specific power indicates that the developed WH-SAgMNPs/MWCNTs as the metallic electrodes for the supercapacitors can fill the gap between conventional supercapacitors and batteries.

References

1. A. Borenstein, O. Hanna, R. Attias, S. Luski, T. Brousse and D. Aurbach, *Journal of Materials Chemistry A*, 2017, **5**, 12653-12672.
2. B. Pandit and B. R. Sankapal, *New Journal of Chemistry*, 2017, **41**, 10808-10814.