Electronic Supplementary Information

Highly efficient and stable transparent electromagnetic interference shielding films based on silver nanowires

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Supplementary figures

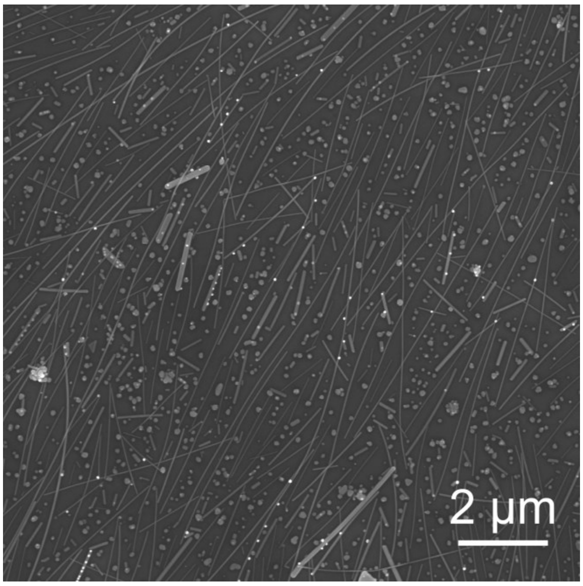

Fig. S1 The supernatant of Ag NWs after the purification process.

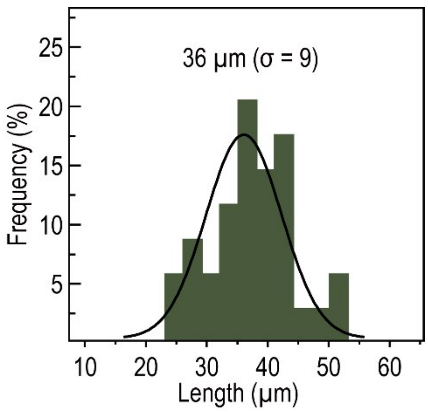

Fig. S2 Length histogram of the purified Ag NWs.

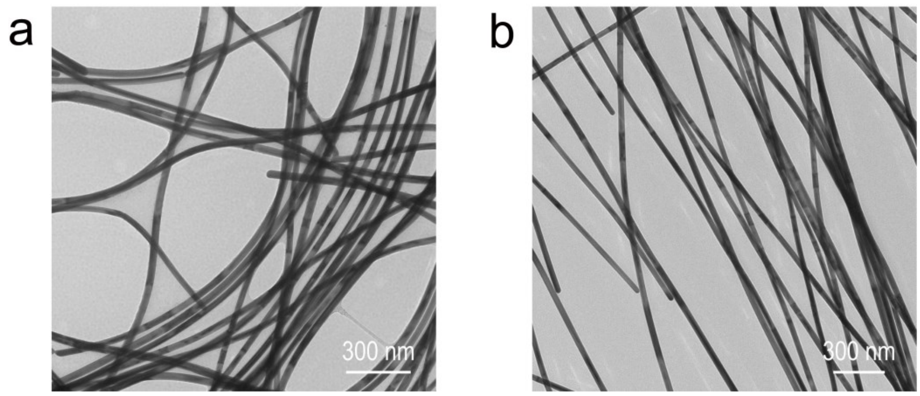

Fig. S3 TEM images of Ag NWs before (a) and after (b) treatment with $NaBH_4$ solution.

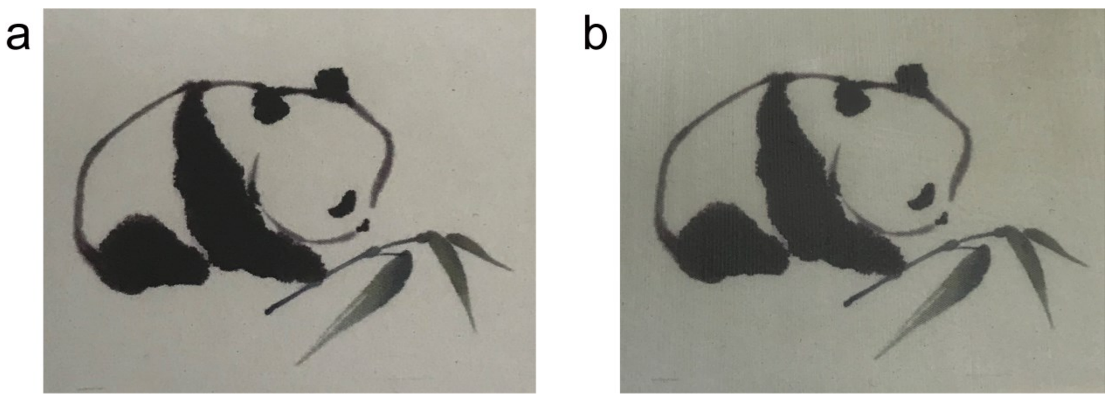

Fig. S4 Digital photographs of the Ag NW/PDDA composite films with coating Ag NWs (a) once and (b) twice.

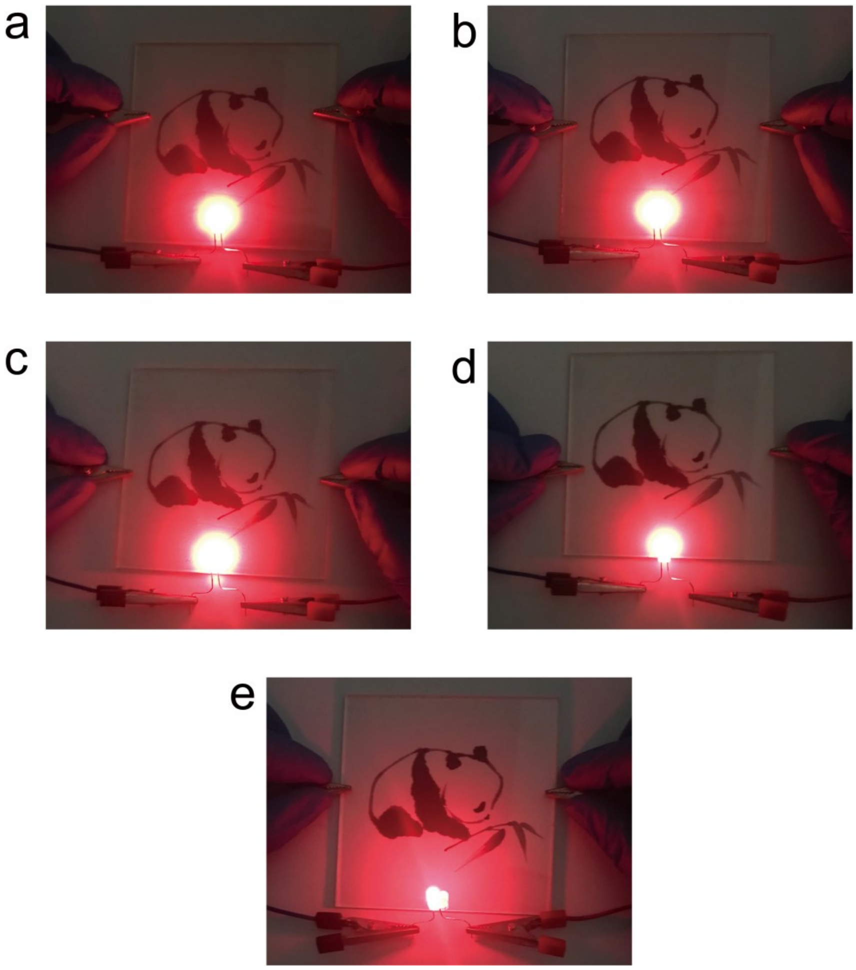

Fig. S5 Images of the Ag MW/PDDA composite films with different Ag NW concentrations detected by a LED lamp. (a) 11.4 mg/mL, (b) 7 mg/mL, (c) 4.7 mg/mL, (d) 3.1 mg/mL and (e) 2.9 mg/mL.

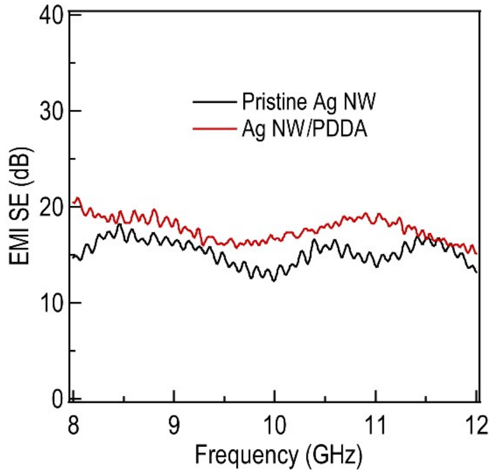

Fig. S6 EMI SE performances of the pristine Ag NW film and Ag NW/PDDA composite film.

Calculation of the volume fraction of Ag NWs

In order to evaluate the volume fraction of Ag NW, the mass of the Ag NWs among the Ag NW layer has to be obtained first. Then we get

$$m = c_1 \times v_1 = 0.05 \times c \times s \times h_1$$

where c_1 and c are the real and initial concentrations of the Ag NWs used to fabricate the Ag NW layer, respectively, s = 10 × 10 cm^2 and h_1 = 4 μm are the area and thickness of the Ag NW layer, respectively. Thus, the volume of the Ag NWs among the Ag NW layer can be calculated:

$$v_{Ag} = \frac{m}{\rho}$$

where ρ = 10.49 g cm^{-3}. Based on the above obtained volume of Ag NWs, the volume fraction of Ag NW can be calculated now. Hence, we have

$$v = \frac{v_{Ag}}{v_{Ag} + v_{PDDA}} \approx \frac{v_{Ag}}{v_{PDDA}} = \frac{v_{Ag}}{s \times h_2}$$

where h_2 = ~2 nm is the thickness of the PDDA layer.[1]

Reference

[1] Y. Li, P. Cui, L. Y. Wang, H. Lee, K. Lee and H. Lee, *ACS Appl. Mater. Interfaces*, 2013, **5**, 9155–9160.