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

Electronic Supplementary Information

An efficient PEDOT-coated textile for wearable thermoelectric generators and strain sensors

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Preparation of n-type CNTs paper

The p-type carbon nanotubes (CNTs) paper was obtained from Nanjing Xianfeng Nano Co. The n-type CNT paper doping was based on a previously published procedure that 5 vol. % polyethyleneimine (PEI) and $NaBH_4$ (0.378 g) were added to the deionized water (10 mL), and then the n-type CNTs paper was placed on mixture solution for 48 h. Finally, the sample washed with DI water and dried in air at 50 ^{o}C.[1]

Different Strain

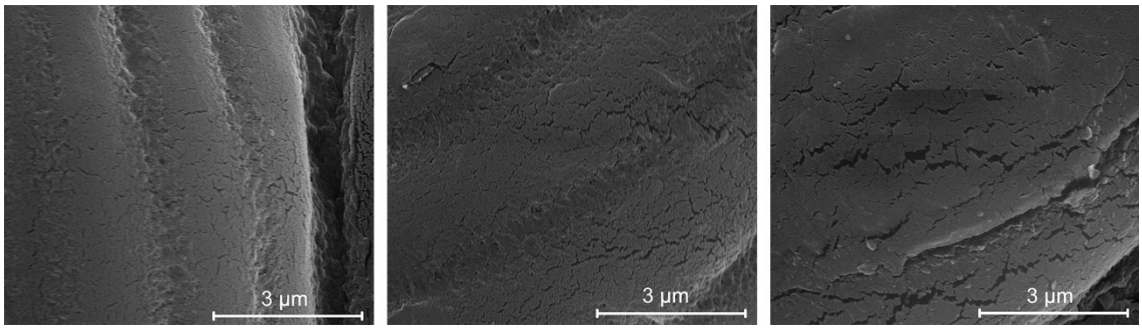

Fig. S1. SEM images of the MT@PEDOT with (d) 0%, (e) 30%, and (f) 50 % strain.

Raman Spectra

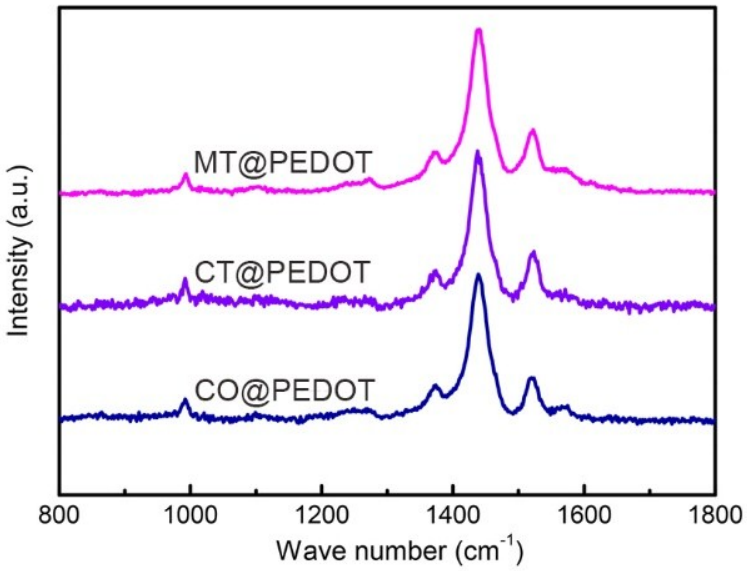

Fig. S2. Raman of PEDOT-coated electronic textiles.

Resistance dependence on deposition times of VPP-PEDOT textile

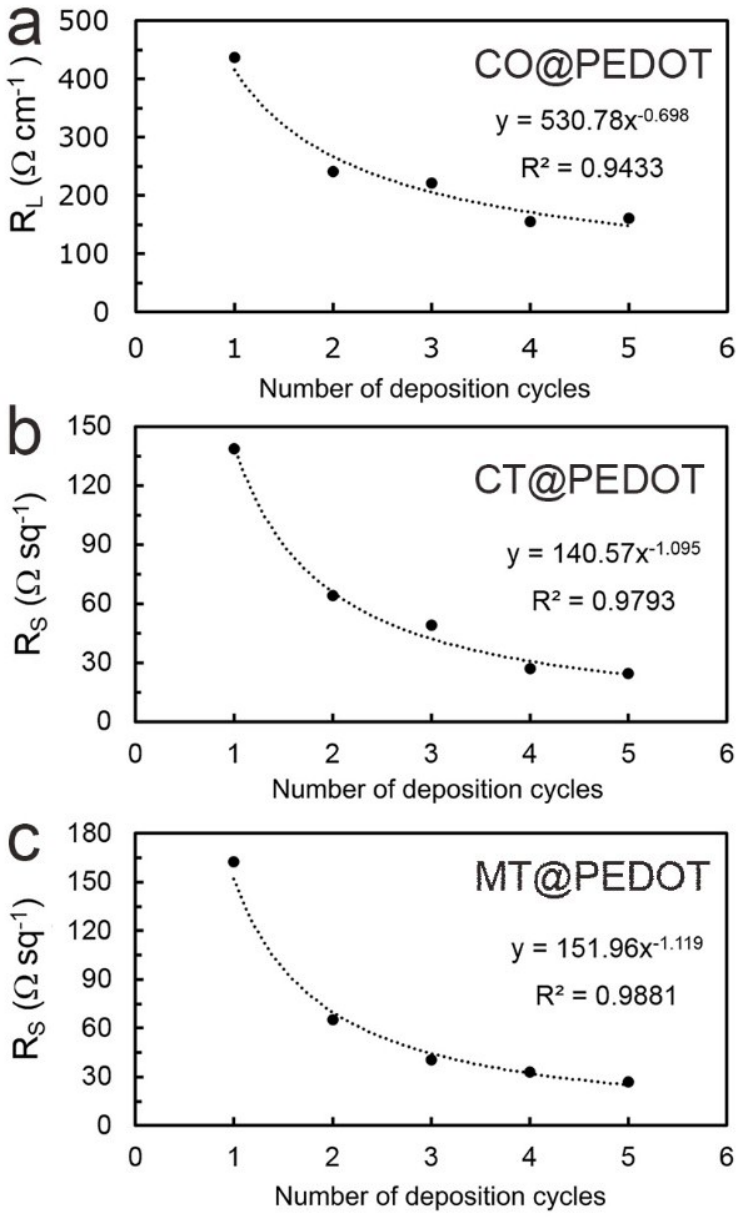

Fig. S3. Fitted curve of number of deposition cycle: (a) CO@PEDOT, (b) CT@PEDOT, and (c) MT@PEDOT.

Resistance and GF dependence on strain of MT@PEDOT

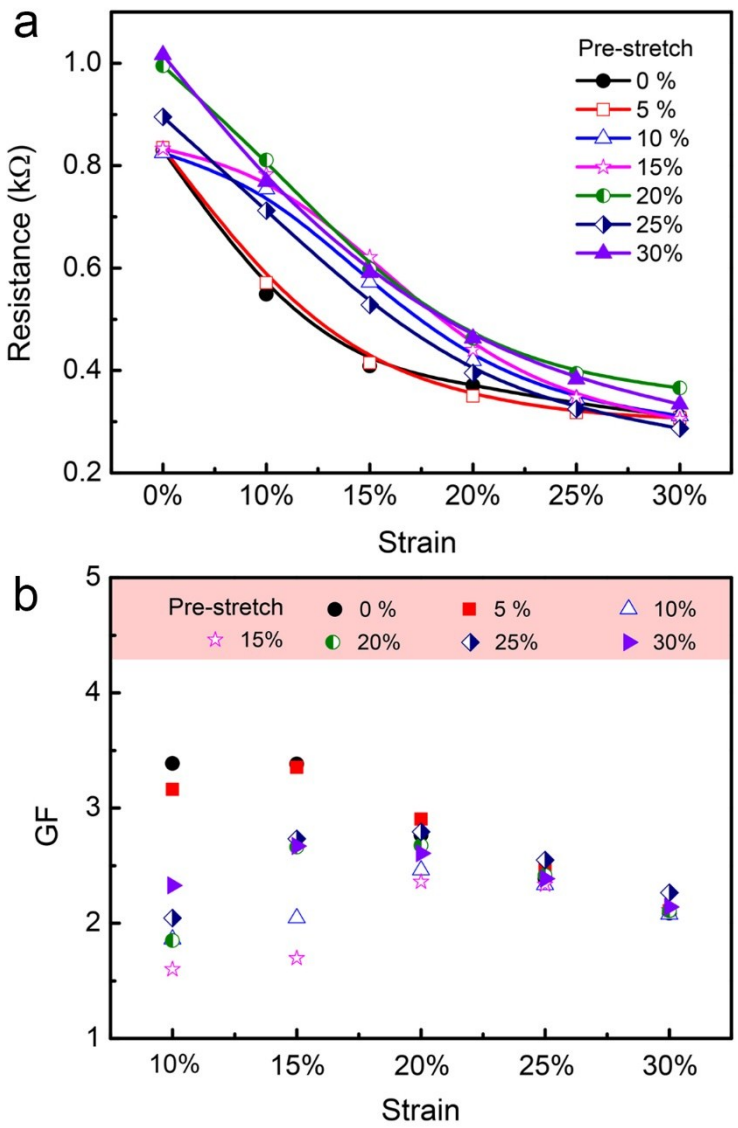

Fig. S4. Strain-dependent (a) resistance and (b) GF of MT@PEDOT strain sensors with different pre-stretch.

The doping level change Of PEDOT coating with heat treatment

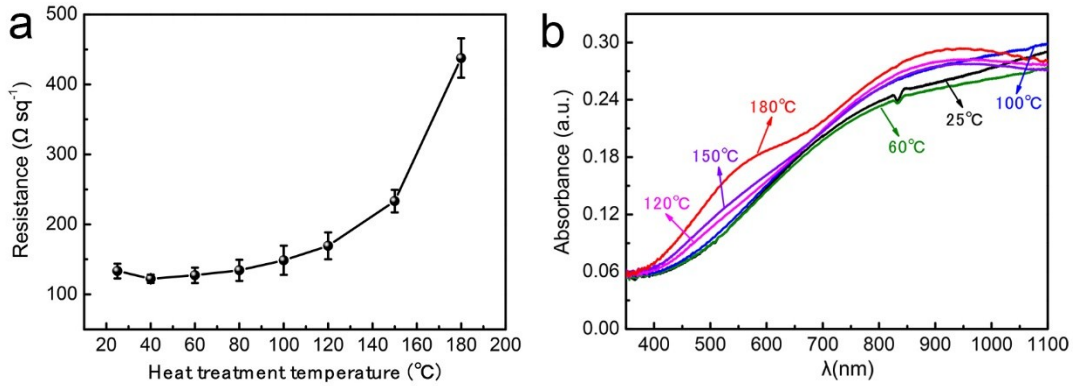

Fig.S5 The sheet resistance (a) and UV–Vis–NIR spectra (b) of PEDOT coating on glass substrate with different heat treatment temperature.

MT@PEDOT with heat treatment

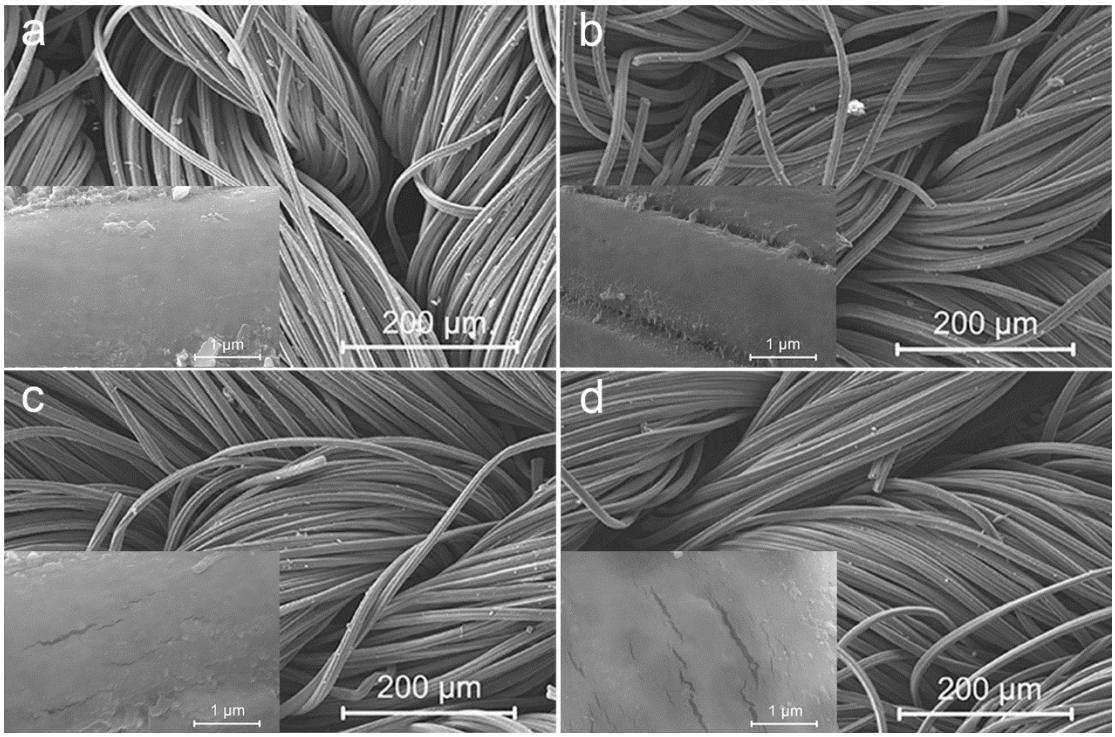

Fig. S6 SEM images of the MT@PEDOT with different heat treatment temperature: (a). 25 ^{o}C, (b) 60 ^{o}C, (c) 100 ^{o}C, (d) 180 ^{o}C.

The change of resistance at low temperature

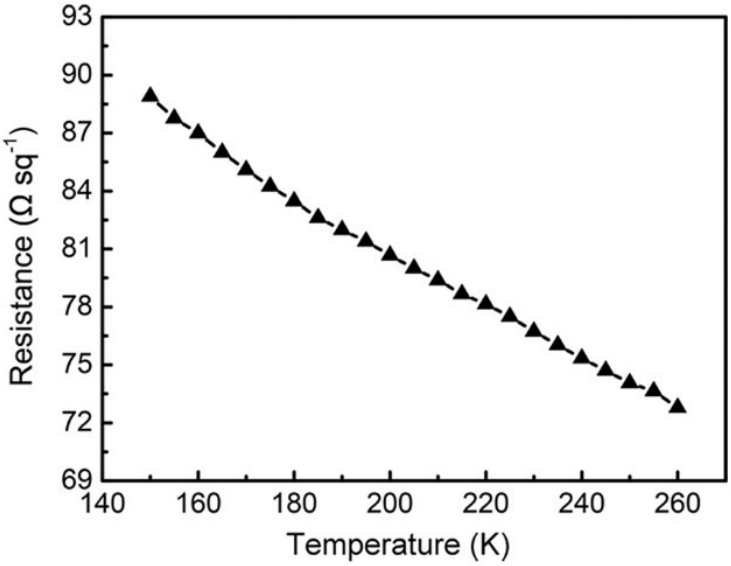

Fig.S7 The sheet resistance of MT@PEDOT with different temperature.

GF dependence on strain of MT@PEDOT with different number of deposition cycles

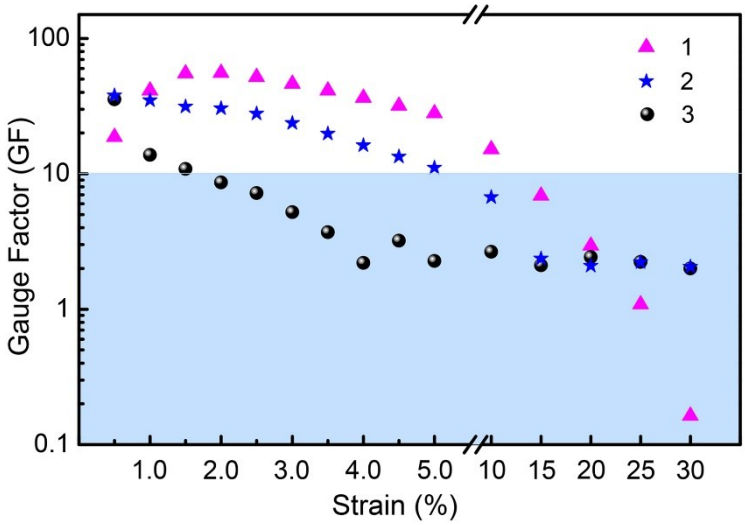

Fig. S8. Strain-dependent Gauge factor (GF) of MT@PEDOT strain sensors with different number of deposition cycles;

Resistance dependence on strain of MT@PEDOT

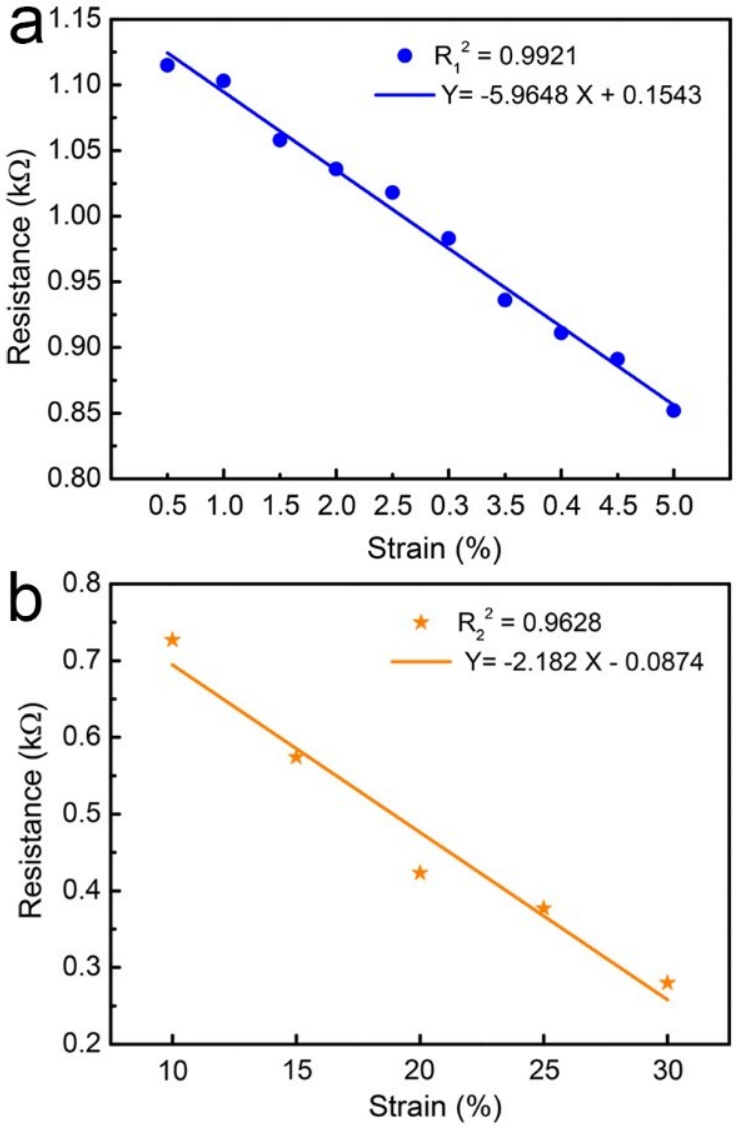

Fig. S9. The linear regression equation of MT@PEDOT of strain dependent resistance with strain (a) 0.5-5 % and (b) 10-30 %.

Resistance dependence on stretch times

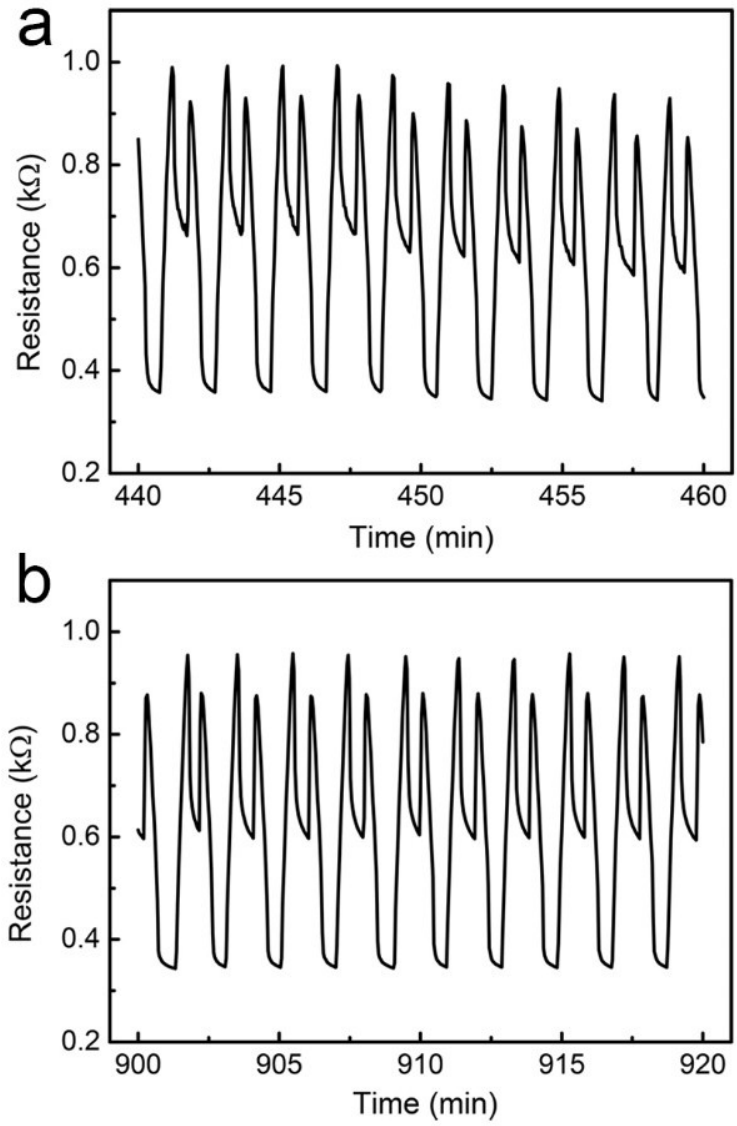

Fig. S10. Cyclic stretch/release test data of MT@PEDOT with different time: (a) 440-460 min and (b) 900-920 min.

Microstructure change

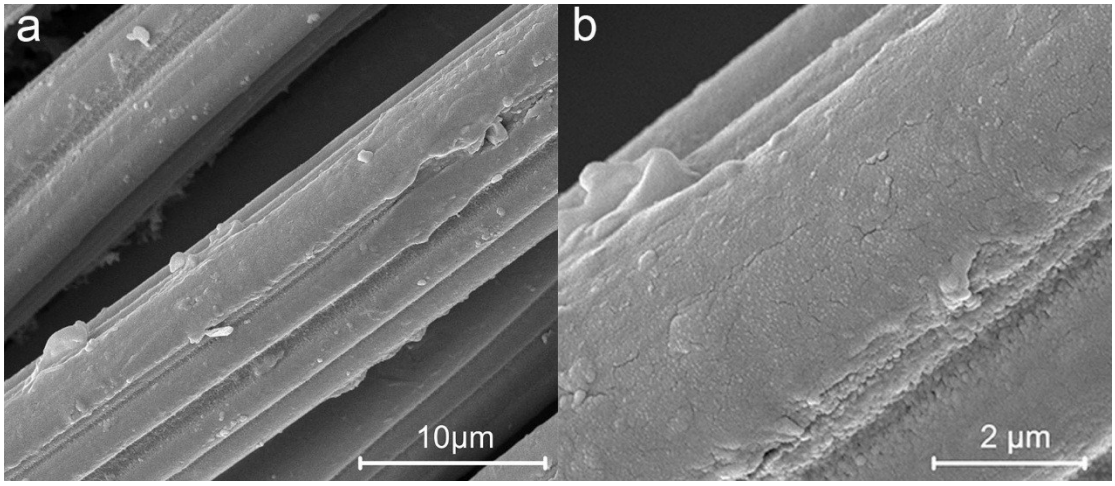

Fig. S11. SEM images of the MT@PEDOT after 500 cyclic loading.

Notes and references

1 C. Yu, A. Murali, K. Choi, Y. Ryu, *Energy Environ. Sci.,* 2012, **5,** 9481-9486.