Supporting information

Ultrasensitive self-powered photoelectrochemical detection of methane based on a coaxial integrated carbonene fiber

Supplementary Figures
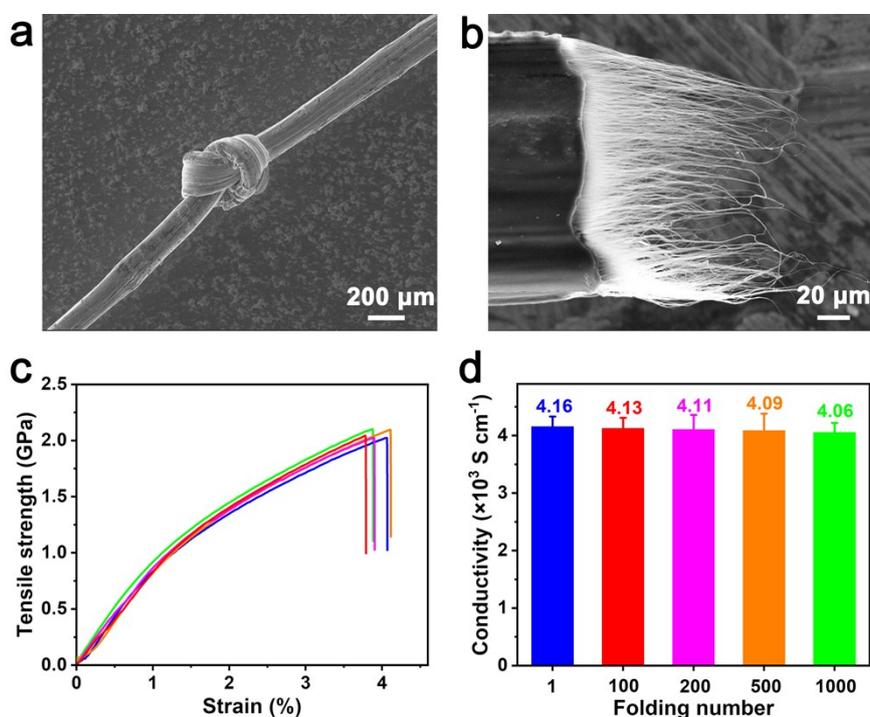
Fig. S1 (a) SEM image of knotted CNT fiber. (b) Cross-sectional SEM image of CNT fiber. (c) Stress-strain curves of CNT fibers. (d) Electrical conductivity of CNT fibers during 1000 folding cycles.
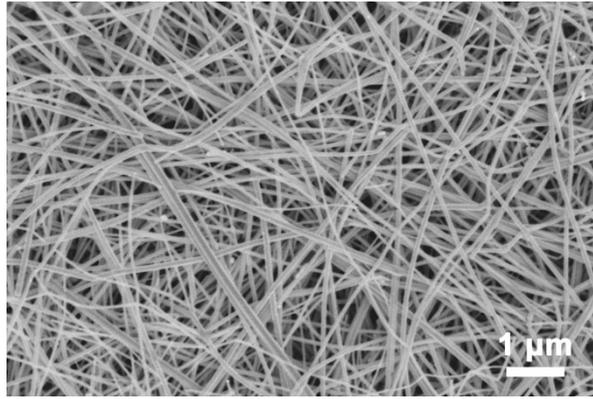
Fig. S2 SEM image of AgNWs.
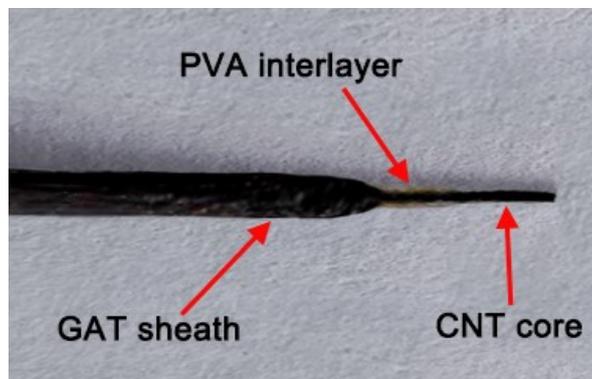
Fig. S3 Photograph of a CNT-PVA-GAT fiber indicating the coaxial structure.
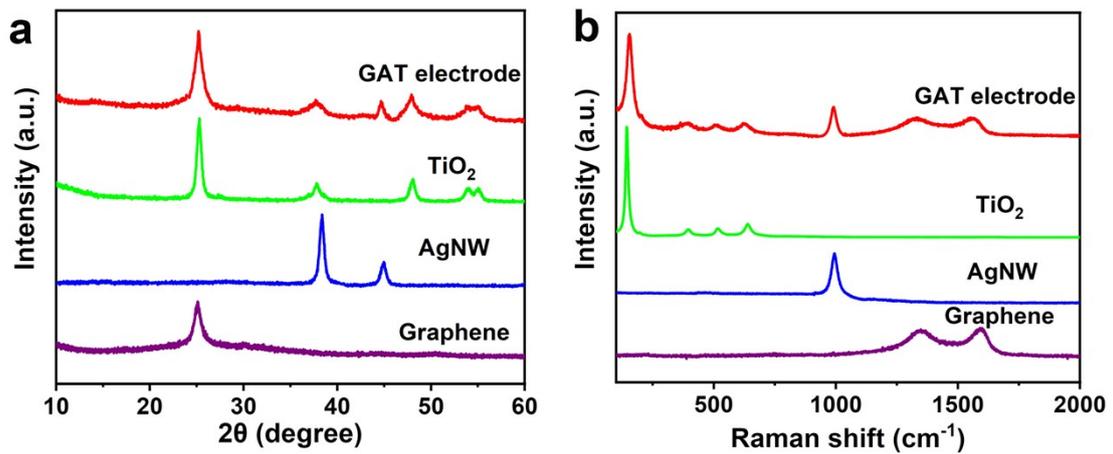
Fig. S4 XRD patterns (a) and Raman spectra (b) of graphene, AgNW, TiO_2 and GAT electrode.
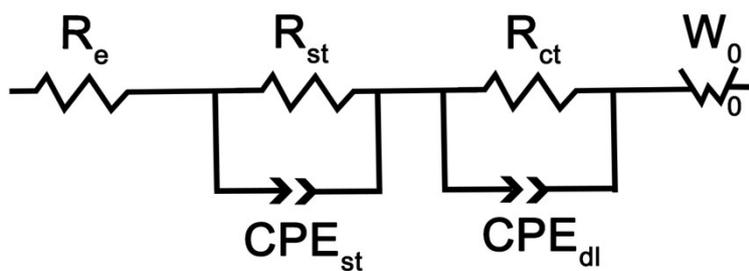
Fig. S5 Equivalent circuit model.
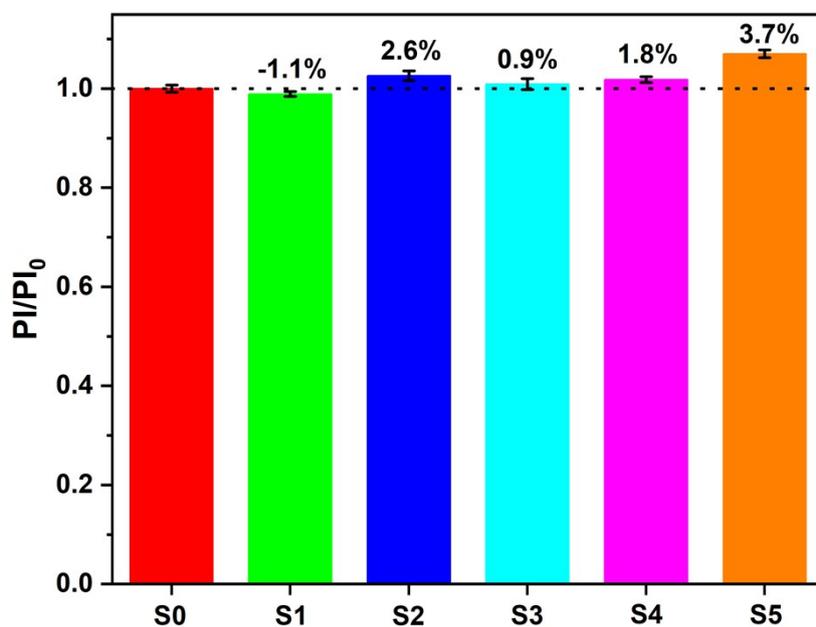
Fig. S6 Photocurrent ratio of the CNT-PVA-GAT photoelectrochemical sensor in 90 ppm methane in the absence (PI_0) and presence (PI) of 90 ppm carbon dioxide (S1), ammonia (S2), carbon monoxide (S3), methanol (S4) and ethane (S5), respectively.
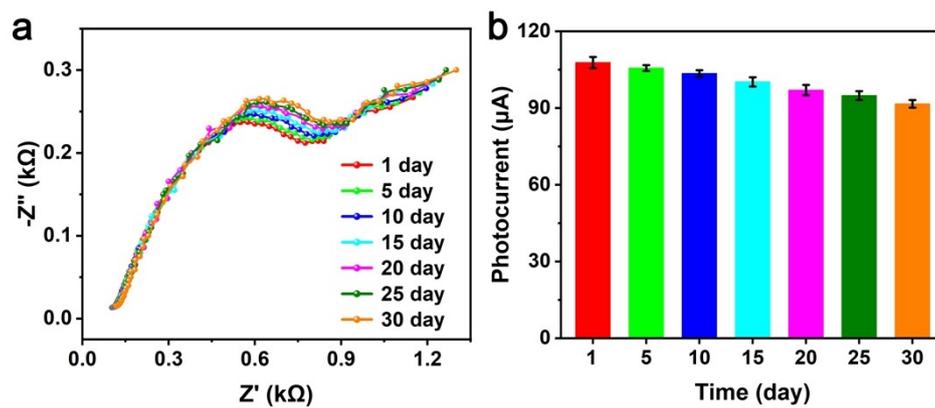
Fig. S7 EIS (a) and photocurrent variation (b) of the CNT-PVA-GAT photoelectrochemical sensor over 30 days in real-world situations.