Electronic Supplementary Information

Non-Enzymatic Hydrogen Peroxide Electrochemical Sensor Based on Three-Dimensional MnO_2 Nanosheets/Carbon Foam Composite

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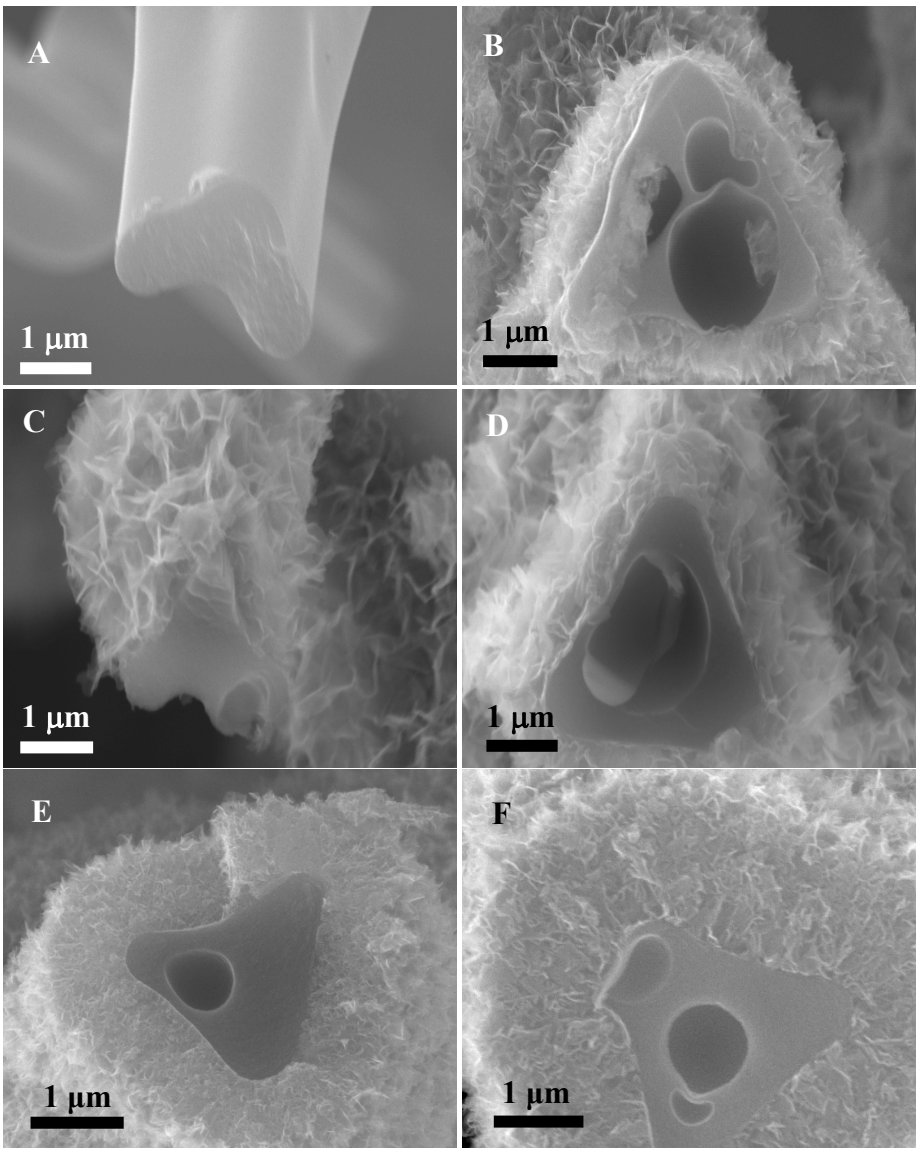

Fig. S1 Cross section view SEM images of the as-prepared 3D porous nanomaterials, carbon foam (CF, A), MnO_2/CF0.5 (B), MnO_2/CF1 (C), MnO_2/CF2 (D), MnO_2/CF3 (E) and MnO_2/CF5 (F).

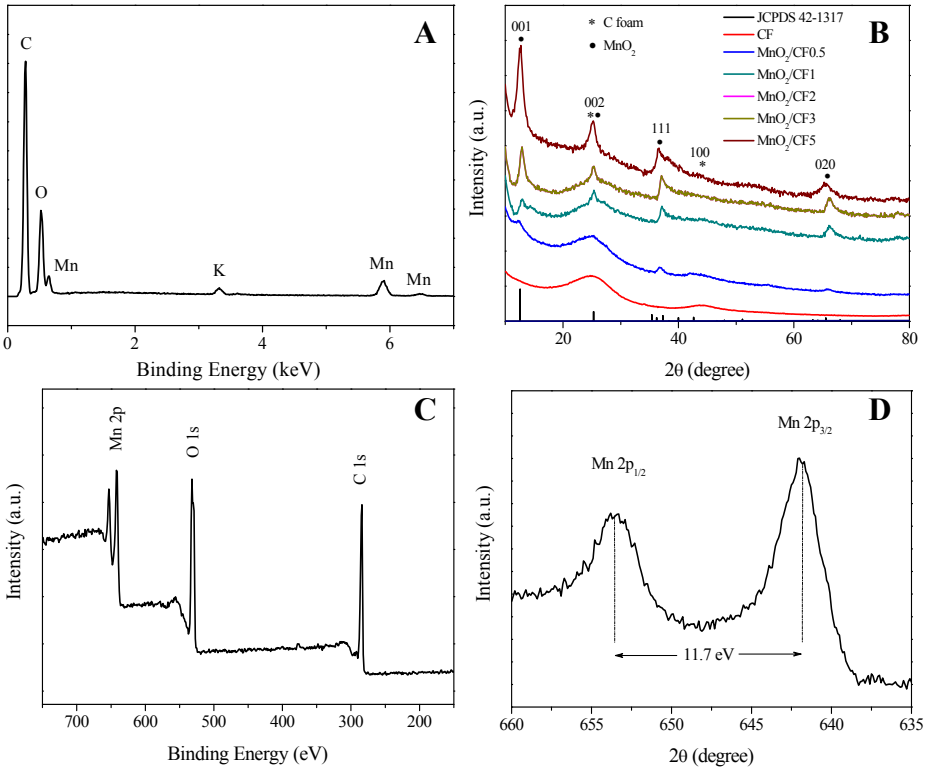

Fig. S2 (A) EDS spectrum of MnO_2/CF0.5. (B) XRD patterns of the carbon foam (CF) and the MnO_2/CF composites. (C, D) XPS survey spectra of MnO_2/CF0.5 (C) and the core-level XPS signals of Mn 2p (D).

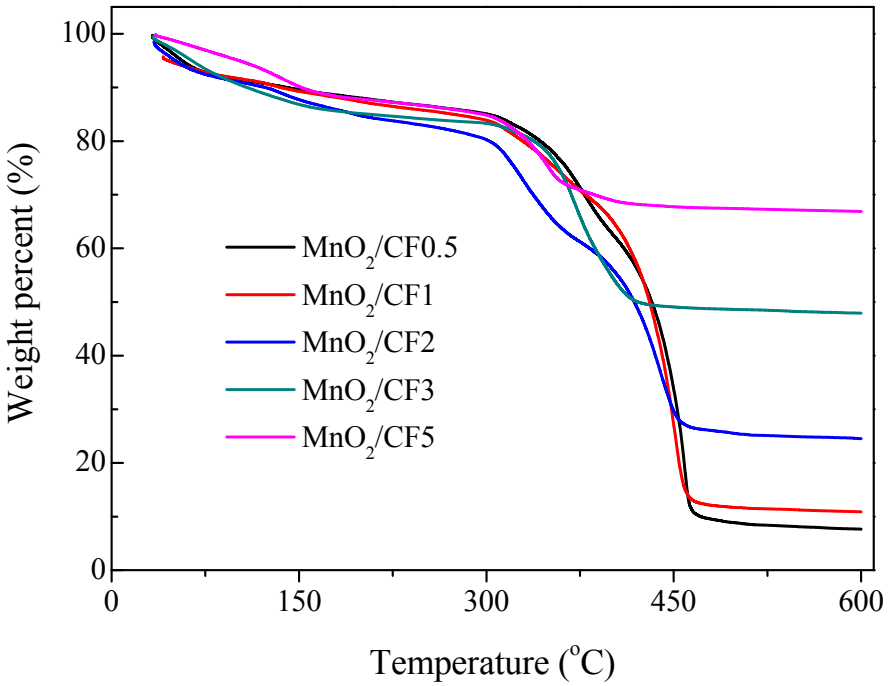

Fig. S3 Thermogravimetric (TG) plots of CF and MnO2/CF composites.

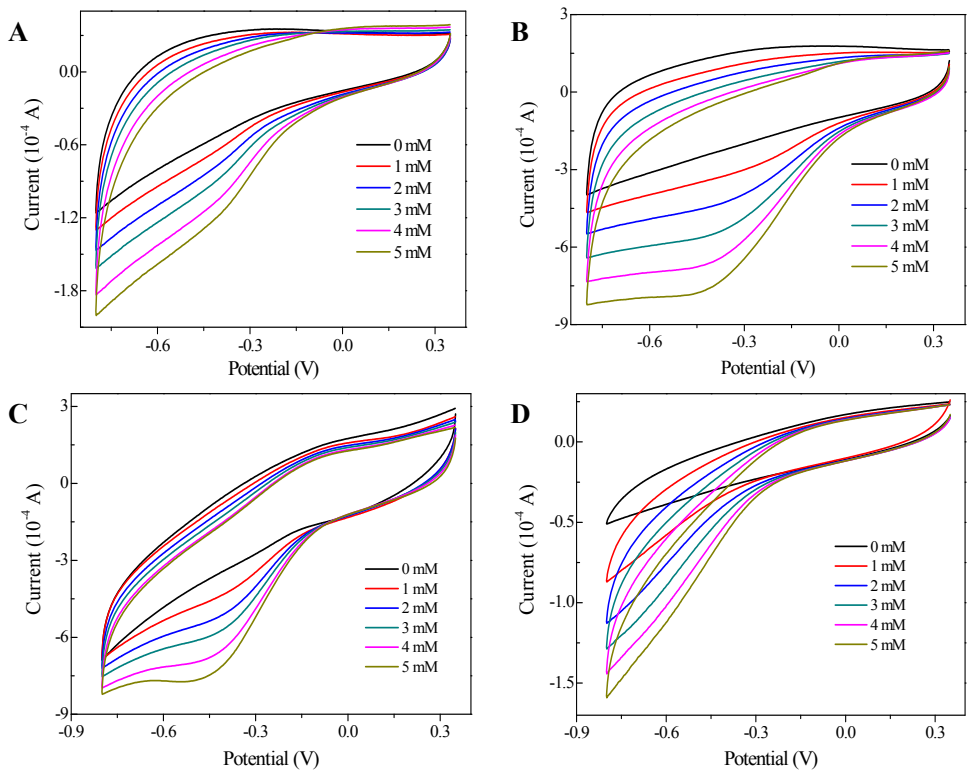

Fig. S4 CVs of MnO_2/CF0.5 (A), MnO_2/CF1 (B), MnO_2/CF3 (C) and MnO_2/CF5 (D) in 0.1 M PBS solution (pH=7.4) with the absence and presence of H_2O_2 at the scan rate of 0.02 V/s.

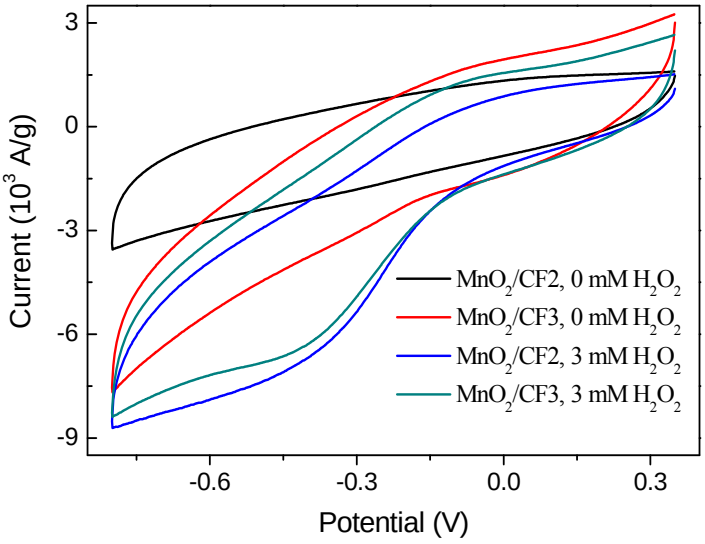

Fig. S5 CVs of MnO_2/CF2 and MnO_2/CF3 electrodes in 0.1 M PBS solution (pH=7.4) with absence and presence of 3 mM H_2O_2. Potential scan rate 0.02 V/s. The currents are normalized to the mass loading of MnO_2.

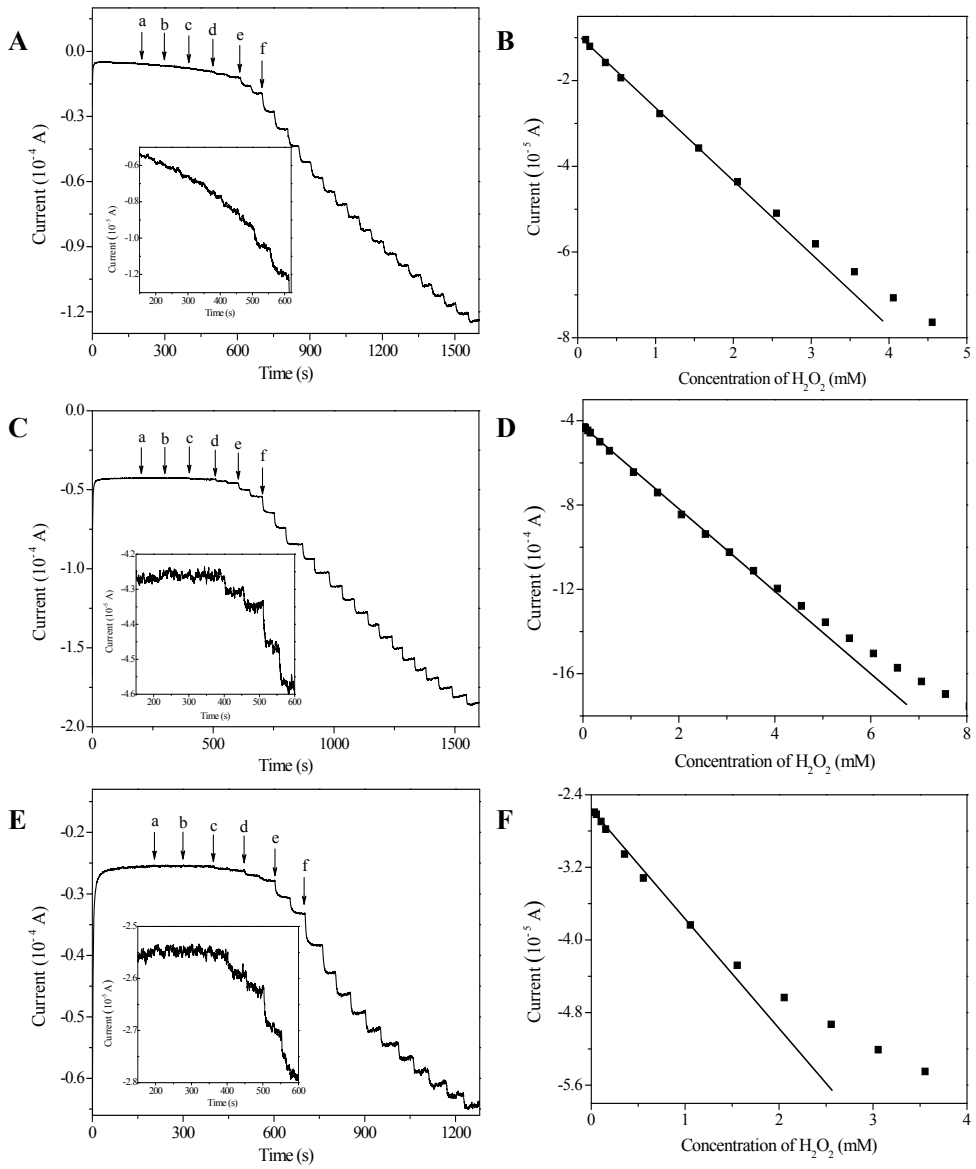

Fig. S6 The amperometric responses of the electrode to H_2O_2, MnO_2/CF0.5 (A), MnO_2/CF1 (C), MnO_2/CF3 (E), with 10 μL 7.5 mM, 15 mM, 60 mM, 0.15 M, 0.6 M and 1.5 M H_2O_2 added into the PBS solution at a, b, c, d, e, f, respectively. Insets are the corresponding amperometric responses to low H_2O_2 concentrations at the MnO_2/CF electrodes. (B, D, F) The corresponding plots of the response current *vs.* the H_2O_2 concentration obtained from the MnO_2/CF0.5, MnO_2/CF1, and MnO_2/CF3 electrodes, respectively.

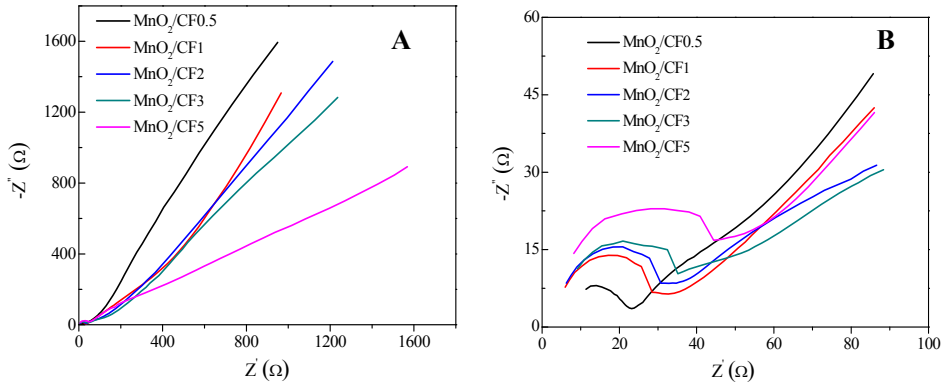

Fig. S7 (A) Nyquist electrochemical impedance spectra of the sensors based on the MnO_2/CF composites (B) the enlarge view of Nyquist plots at high frequency region in (A).