Electronic Supplementary Information

Iron and nitrogen co-doped carbon nanotubes@hollow carbon fibers derived from plant biomass as efficient catalysts for oxygen reduction reaction

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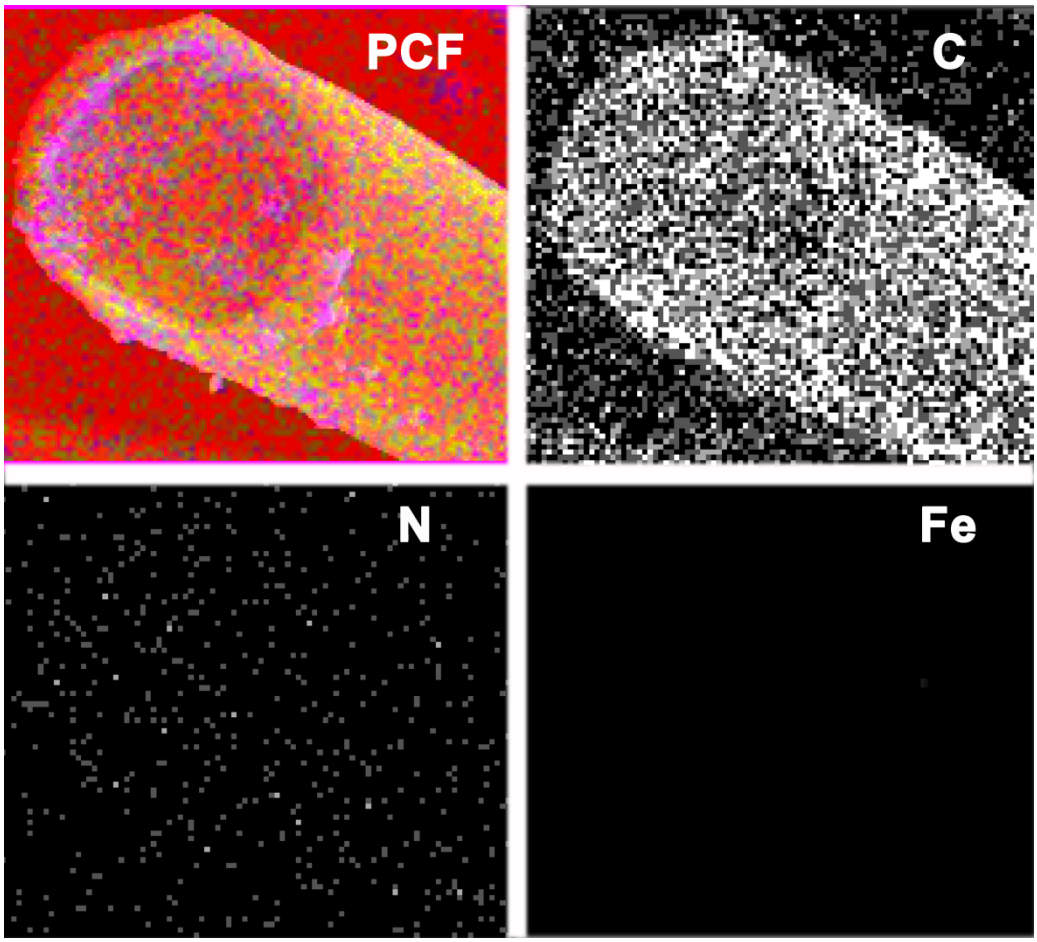

Fig. S1 Elemental mapping spectra of C, N, and Fe for the PCF composite. In the colorized image red represents the C elements and blue represents the N elements.

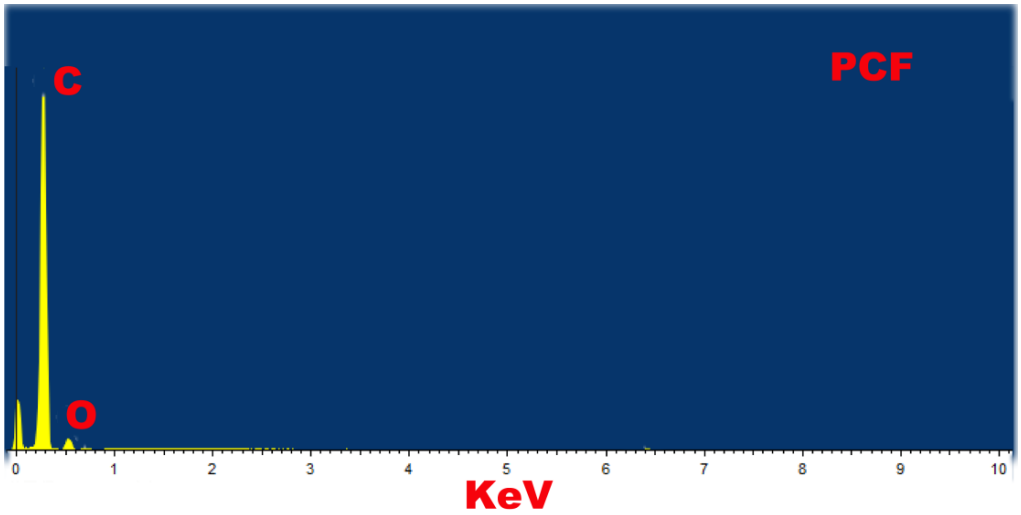

Fig. S2 EDX spectrum of the PCF.

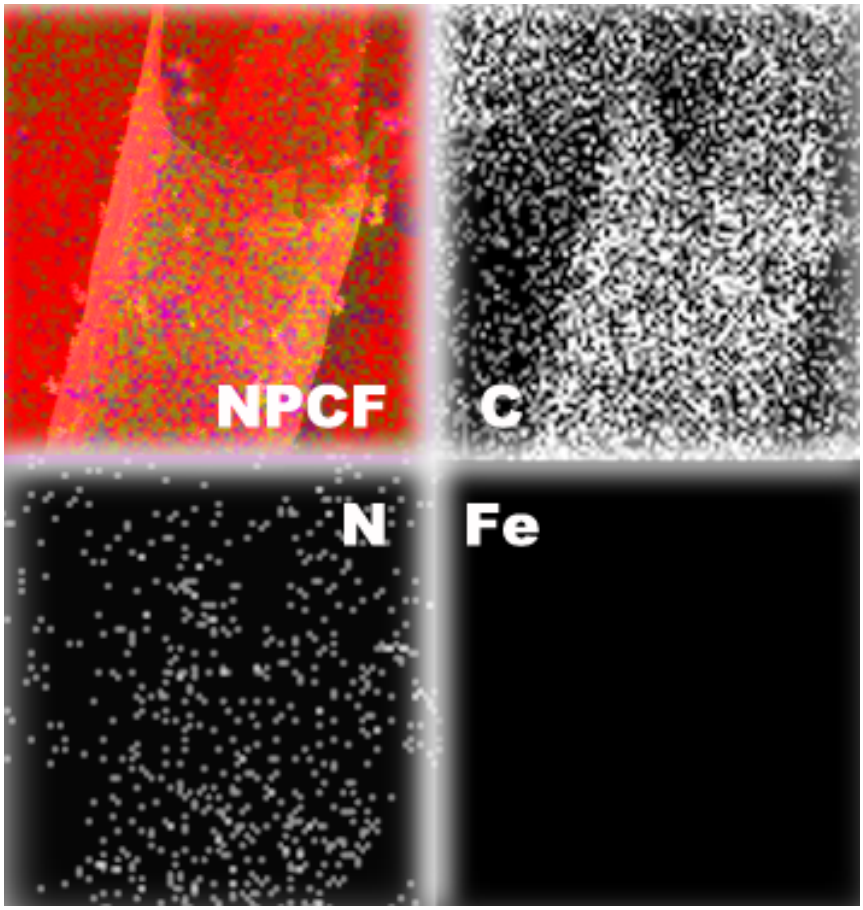

Fig. S3 Elemental mapping spectra of C, N, and Fe for the N/PCF composite. In the colorized image red represents the C elements and blue represents the N elements.

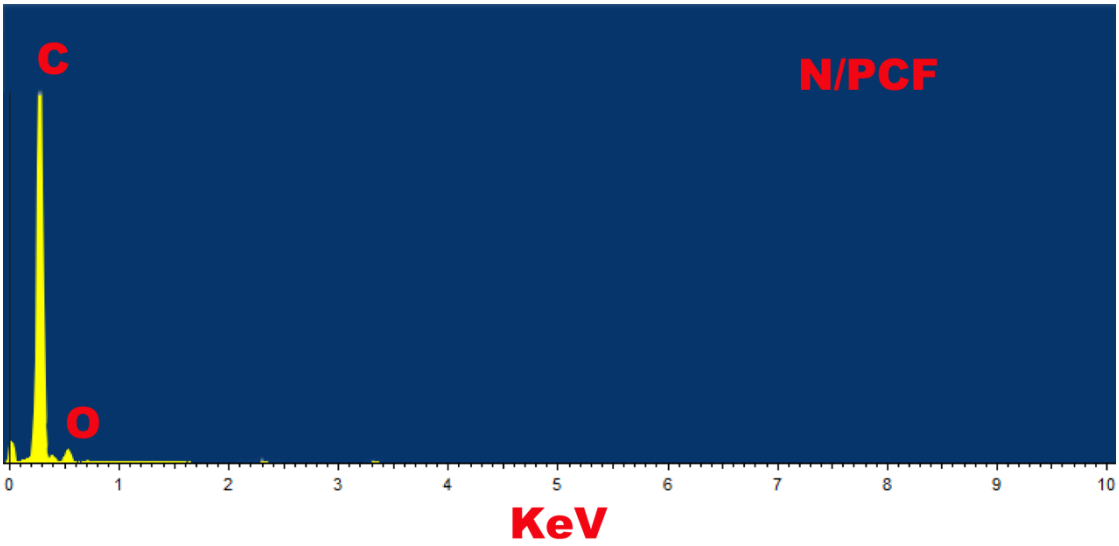

Fig. S4 EDX spectrum of the N/PCF.

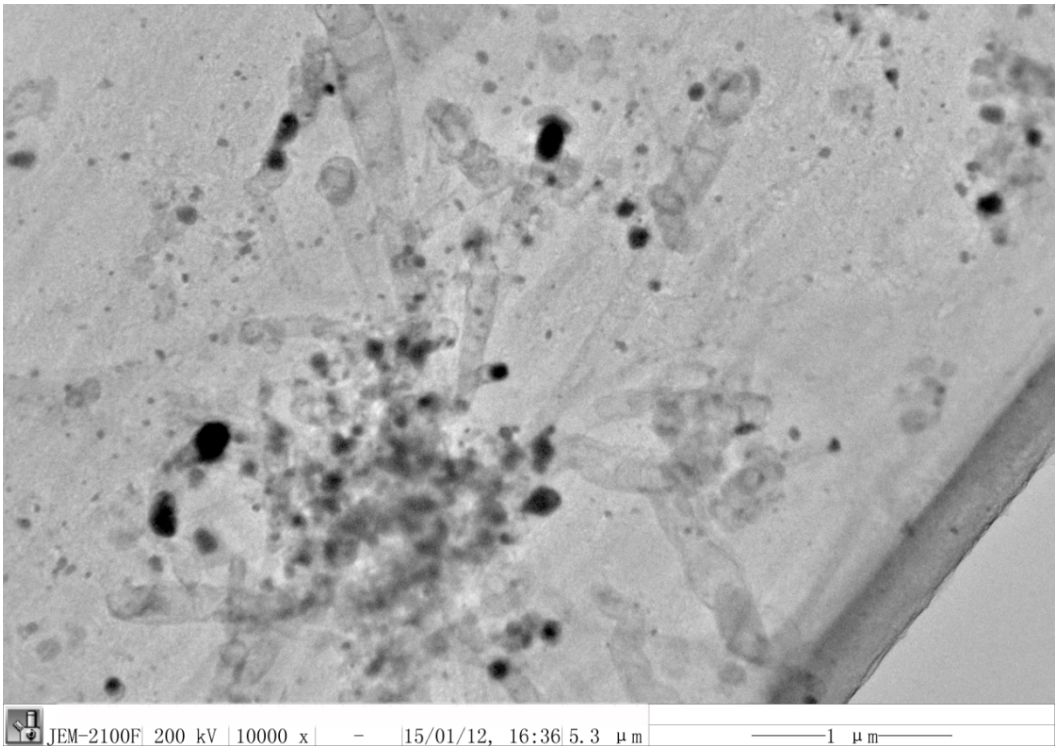

Fig. S5 TEM image of the Fe/N/CNT@PCF sample before the acid pickling process in 2 M H_2SO_4.

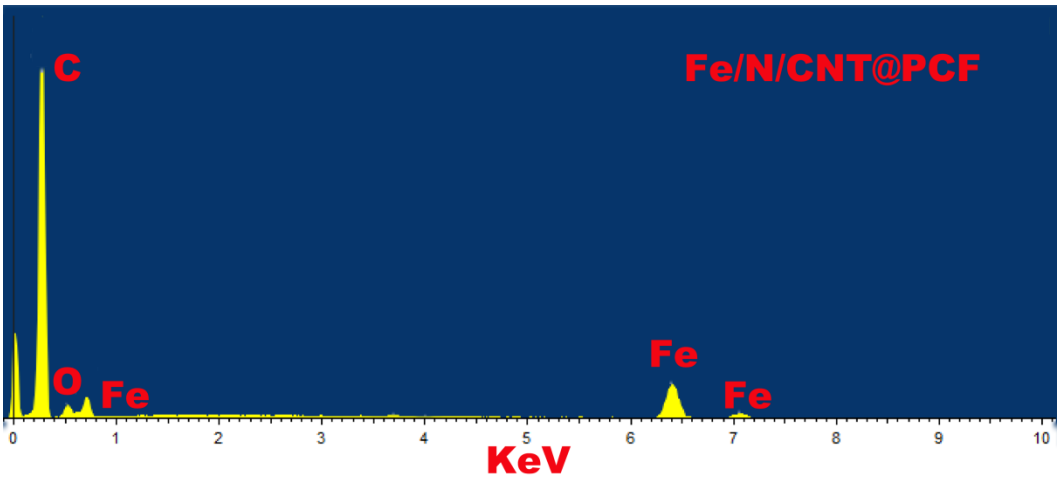

Fig. S6 EDX spectrum of the Fe/N/CNT@PCF before the acid pickling process in 2 M H_2SO_4.

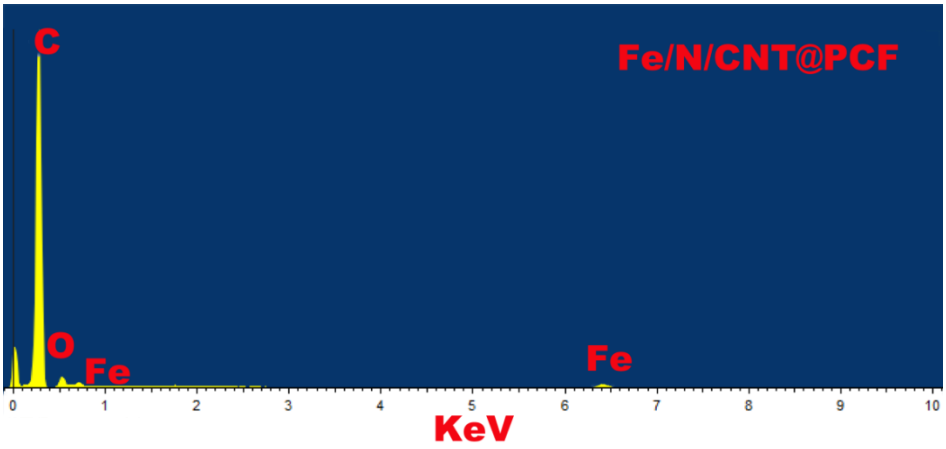

Fig. S7 EDX spectrum of the Fe/N/CNT@PCF after the acid pickling process in 2 M H_2SO_4.

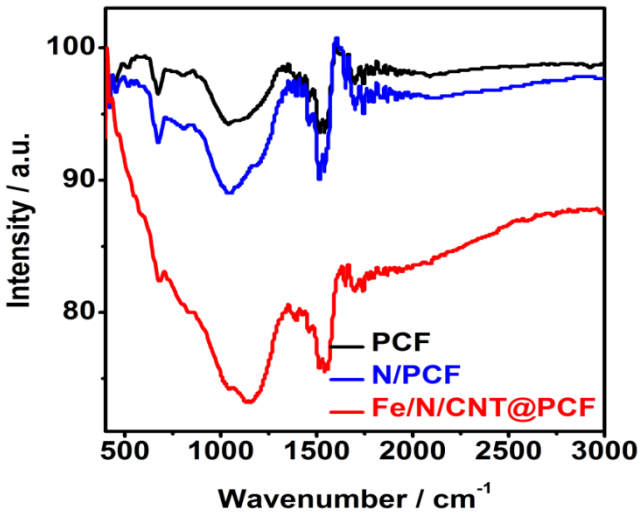

Fig. S8 FT-IR spectra of the PCF, N/PCF, and Fe/N/CNT@PCF samples.

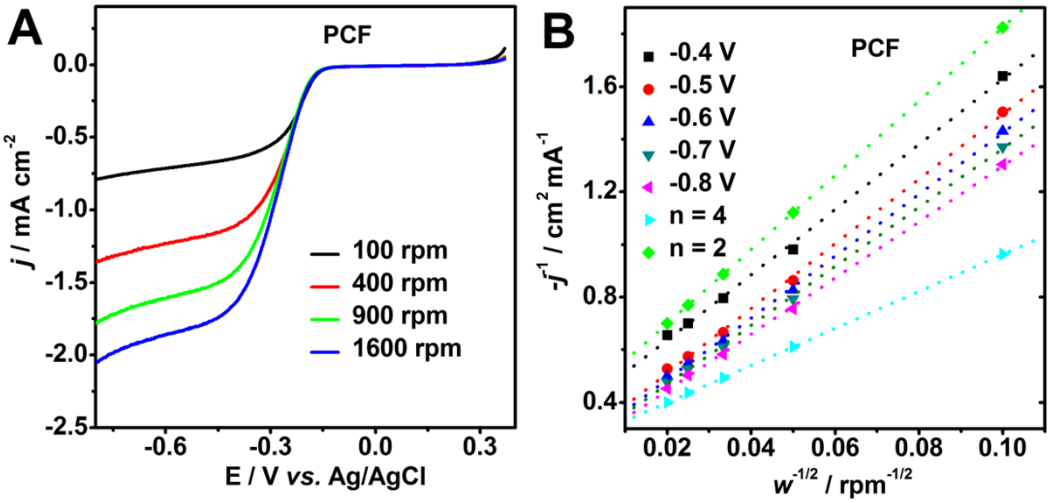

Fig. S9 (A) RDE voltammograms of the PCF in O_2-saturated 0.1 M KOH with various rotation rates at a scan rate of 5 mV s^{-1}. (B) The corresponding Koutecky–Levich plots of the PCF catalyst at different potential.