Supplemental information

1. SEM images and EDS spectra of PAN-PK and PAN-OK

The contents of residual potassium in PAN-PK and PAN-OK were detected by energy dispersive spectroscopy (EDS) analysis, which was carried out on a JEOL JSM 6460 LA scanning electron microscope equipped with an EDS JED 2300. Before the analysis, the sample was coated with Au.

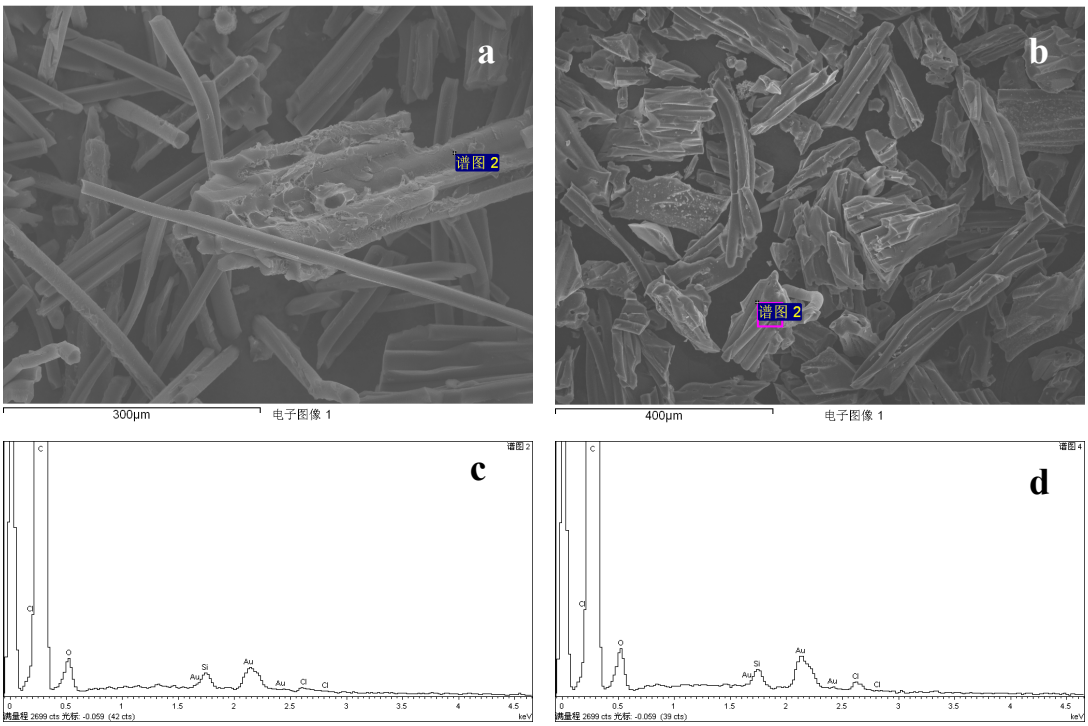

Figure S1 SEM images and EDS spectra of PAN-PK (a, c) and PAN-OK (b, d)

Figure S1 shows the SEM images and EDS spectra of PAN-PK and PAN-OK. No residual potassium was detected by EDS, indicating that the KOH used for the chemical activation was completely neutralized and washed away by HCl aqueous solution and H_2O. This is further confirmed by the fact that no potassium was detected by elemental analysis.

2. Adsorption of CO_2 on PAN-ACFs after adsorption of N_2

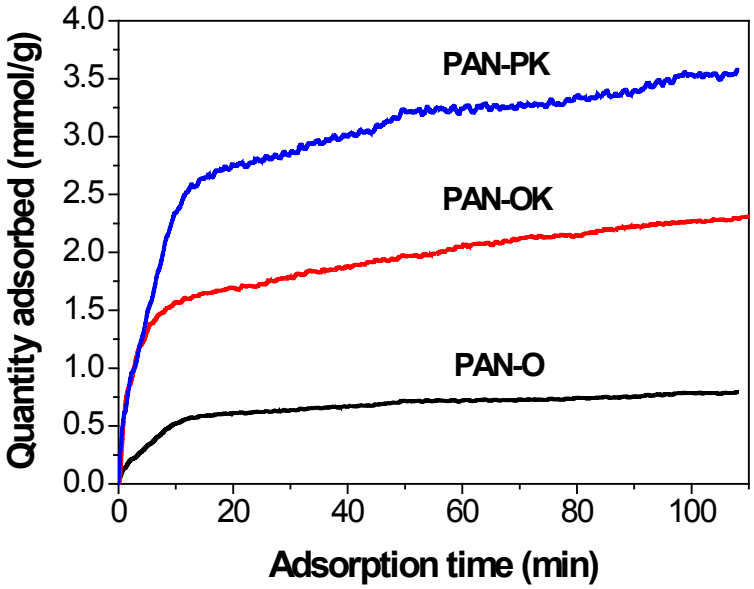

Figure S2 The adsorption isotherms of CO_2 on PAN-ACFs after adsorption of N_2, as measured by the thermogravimetric analyzer

3. Desorption of CO_2 and H_2O from PAN-PK and zeolite 13X

The desorption curves of CO_2 and H_2O from PAN-PK and zeolite 13X were measured on a PFEIFFER Vacuum OmniStar^{TM} Mass Spectrum Analyzer. The typical procedures are as follows: 0.2 g sample was packed into a stainless steel reactor with a diameter of 1 cm and placed into an electric furnace at atmospheric pressure. Then, it was blown with a CO_2 flow with 3 vol.% of H_2O at 25 ^{o}C for 120 min. This was followed by heating the sample from room temperature to 400 ^{o}C at a rate of 5 ^{o}C/min in an argon flow. The outlet CO_2 and H_2O concentrations were recorded by the Mass Spectrum Analyzer.

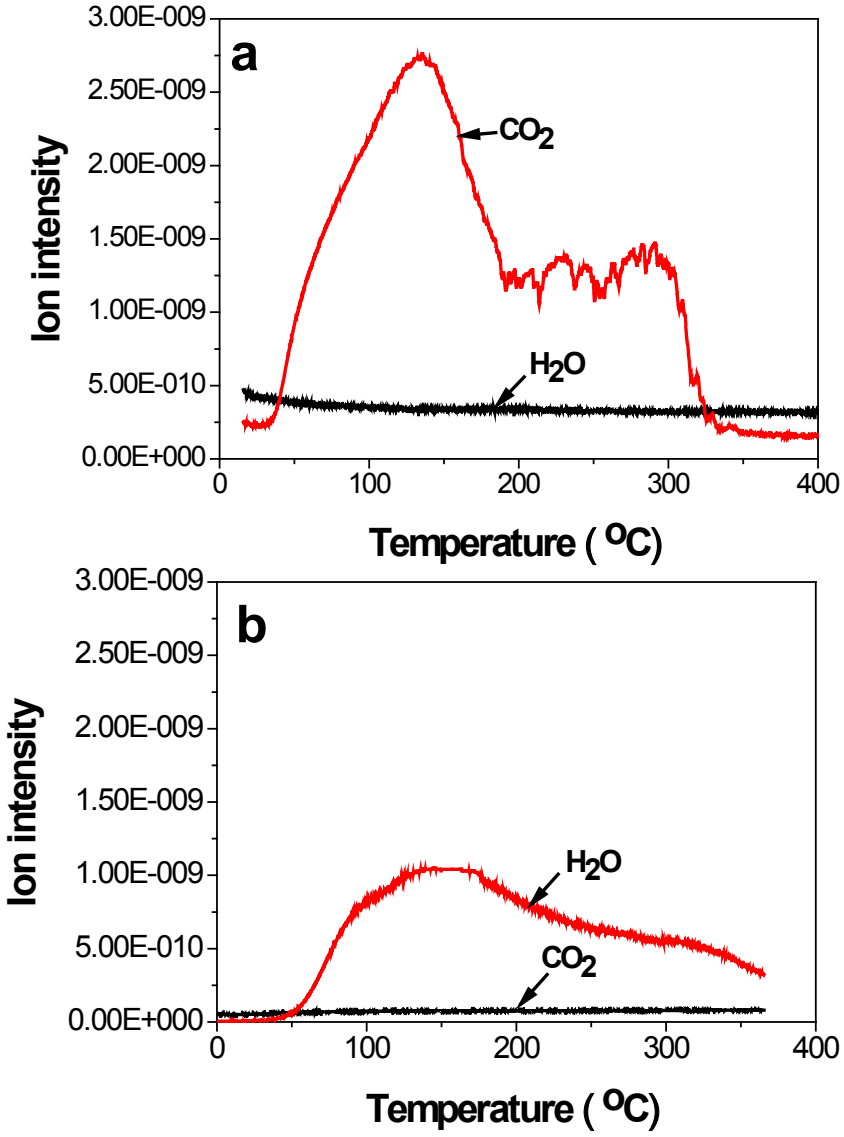

Figure S3 CO_2 and H_2O desorption curves of PAN-PK (a) and zeolite 13X (b) at atmospheric pressure