Supporting information

The application of biochar for CO_2 capture: influence of biochar preparation and CO_2 capture reactor

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This supporting information file includes:

Supporting information Table S1. ICP-OES results of original biochars

Table S1 depicts the major metal and inorganic elemental content of the three biochar raw materials, which slightly affects the characterization results, such as XRD.

Table S1: ICP-OES results of original biochars

	BC-Origin	**WP-Origin**	**CS-Origin**
Ca (mg kg^{-1})	3680.2	24235.2	1037.5
K (mg kg^{-1})	10905.6	6998.3	16368.0
P (mg kg^{-1})	781.3	1208.1	737.4
Si (mg kg^{-1})	3451.5	1787.1	2571.8

Figure S1 shows the XRD pattern of the biochar, which contains a certain amount of Si inorganic signal due to the presence of elemental Si. There are also slight differences in the signals of the plots depending on the activation methods, e.g., the XRD results of the $ZnCl_2$-activated samples show a certain amount of Zn-containing oxides.

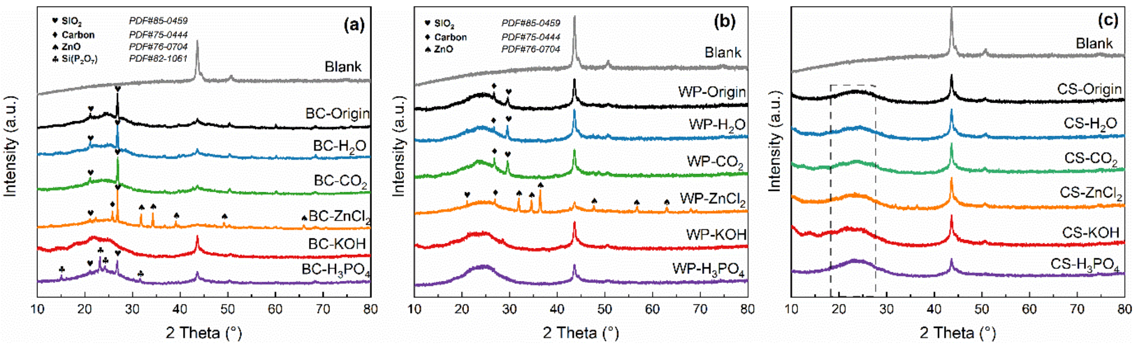

Figure S1: X-ray diffraction patterns of (a) bamboo charcoal biochars, (b) wood pellet biochars, and (c) coconut shell biochars.

Supporting information Figure S6. Zeta-potential.

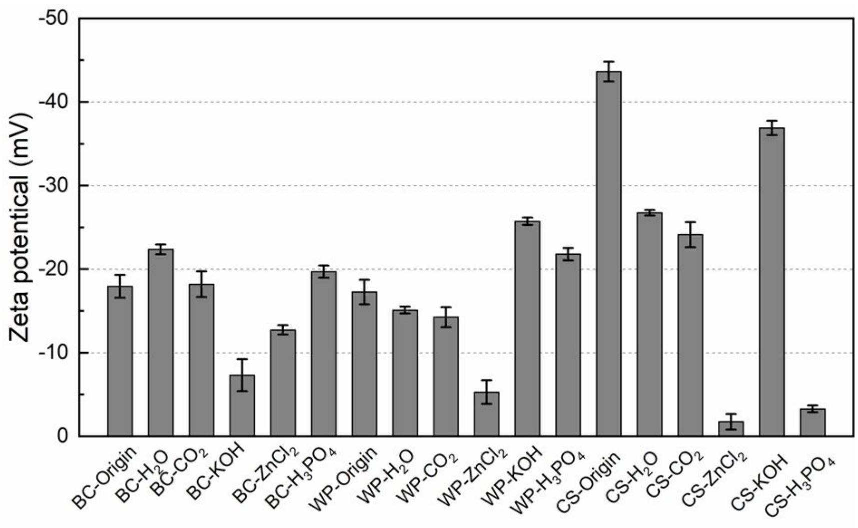

Figure S2: Zeta potentials of lignocellulosic biochar.

Supporting information Figure S3. 15% CO_2 capture breakthrough curve.

Figure S3 introduces the breakthrough curves for a variety of biochar adsorption through a fixed-bed reactor, and the curve for the blank test has been deducted.

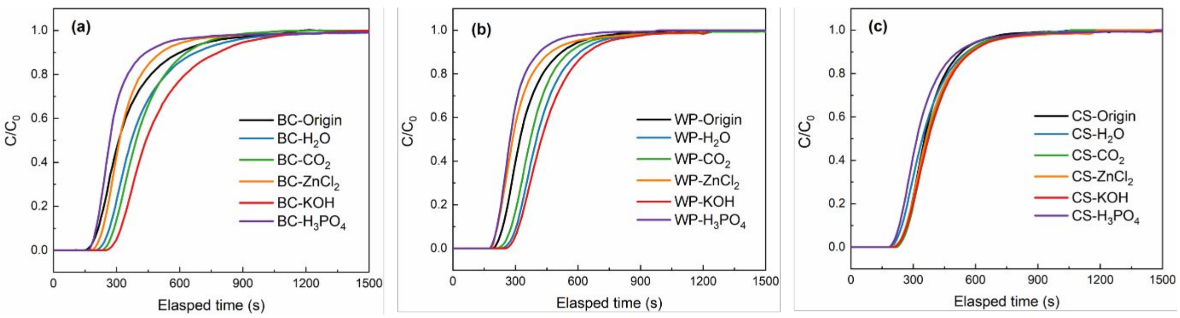

Figure S3: 15% CO_2 capture breakthrough curve of (a) bamboo charcoal biochars, (b) wood pellet biochars, and (c) coconut shell biochars.

Supporting information Figure S4. CO_2 and N_2 adsorption isotherms at 298K.

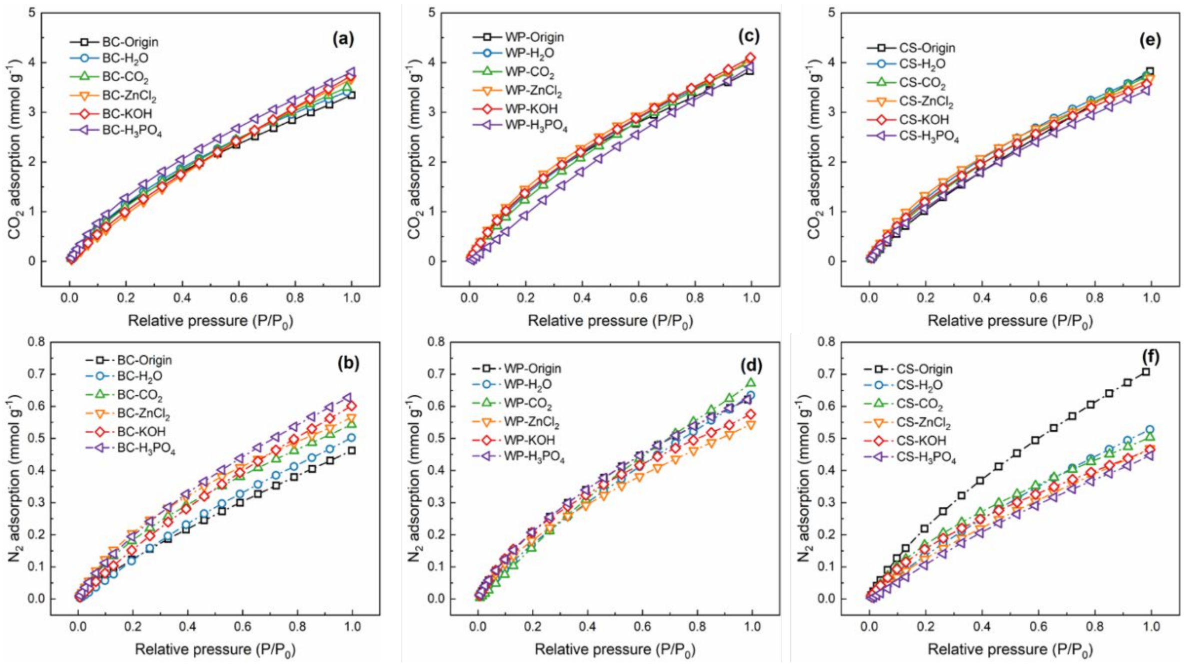

Figure S4. CO_2 and N_2 adsorption isotherms of (a)&(b) BC samples, WP samples (c)&(d) and CS samples (e)&(f) at 298K.