

# Electronic Supplementary Material

## Efficient CO<sub>2</sub> adsorption and mechanism on nitrogen-doped porous carbons

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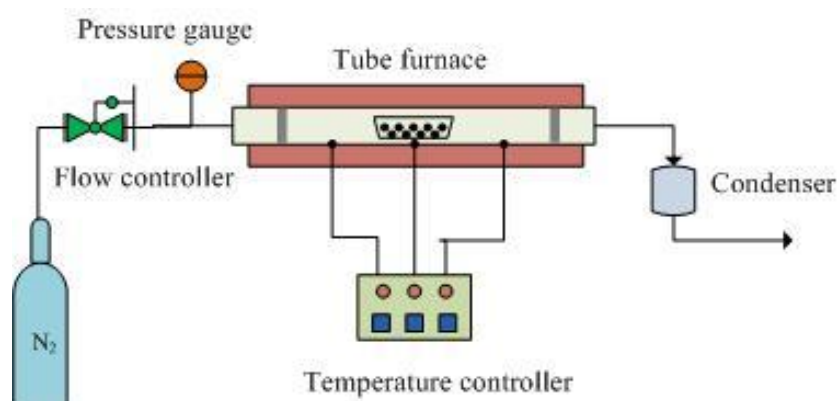


Fig. S1 The schematic diagram of horizontal quartz tubular reactor.

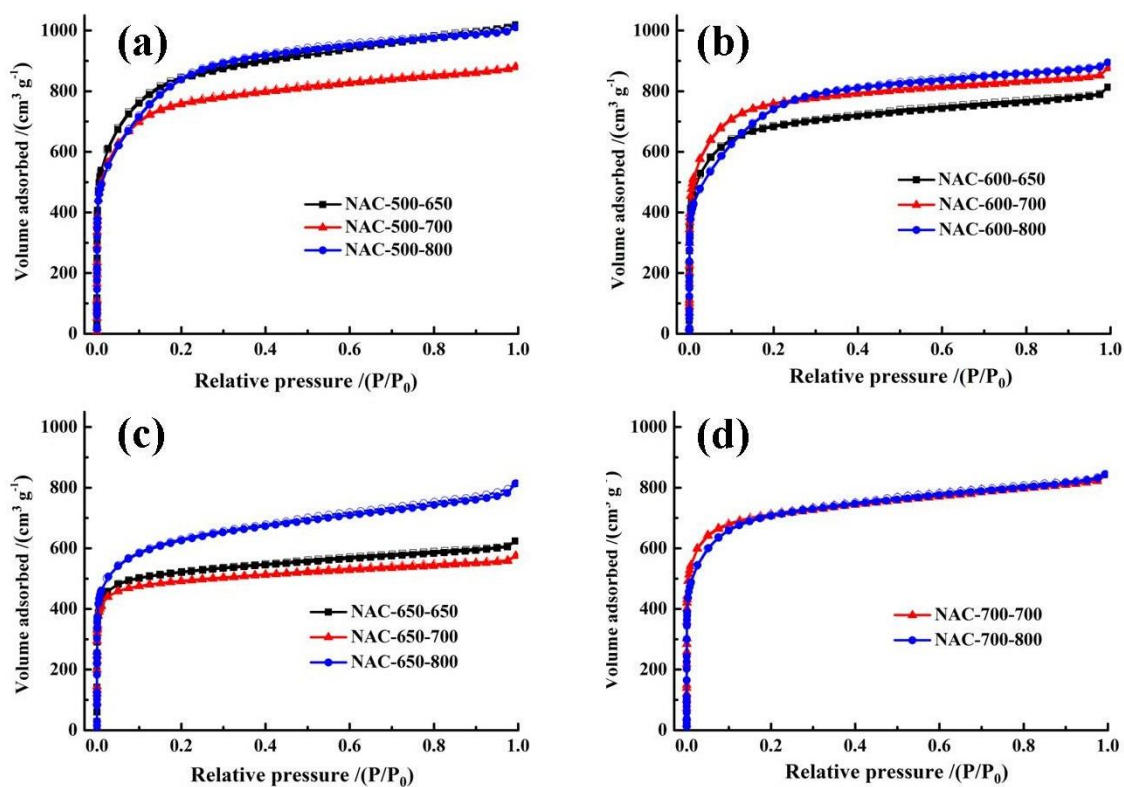


Fig. S2 N<sub>2</sub> adsorption-desorption isotherms of NACs.

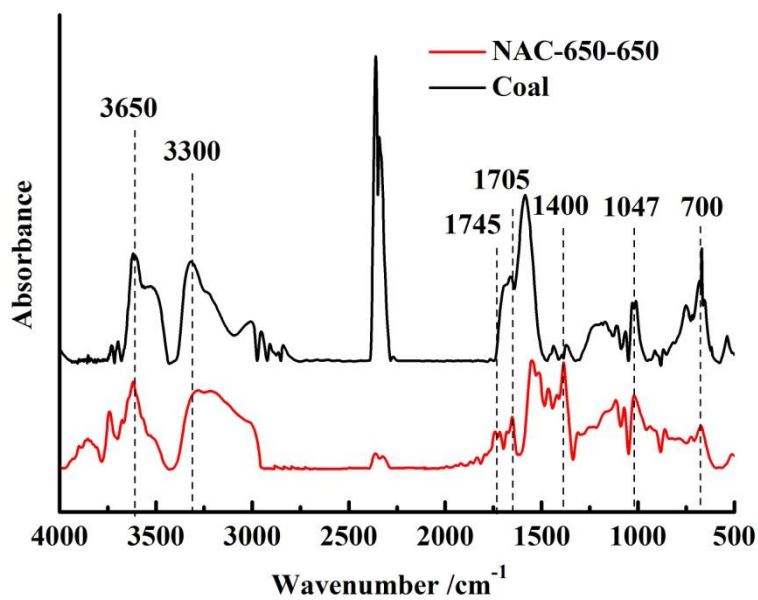


Fig. S3 FT-IR spectra of coal and NAC-650-650.

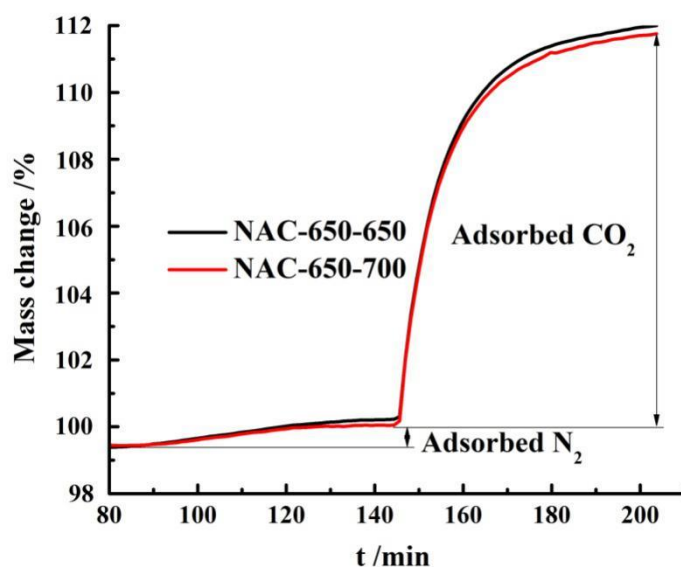


Fig. S4 The adsorption curves during the adsorption process.

Table S1 Proximate analysis and ultimate analysis of Yangchangwan coal

Sample	Proximate analysis $w_{ad}$ (%)				Ultimate analysis $w_d$ (%)				
	Moisture ( $M_{ad}$ )	Ash ( $A_{ad}$ )	Volatile ( $V_{ad}$ )	Fixed carbon ( $FC_{ad}$ )	$C_d$	$H_d$	$O_d$	$N_d$	$S_d$
Yangchangwan coal	10.38	5.40	27.03	57.57	79.18	4.35	9.03	1.47	0.57

Table S2 Kinetic parameters of  $CO_2$  adsorption on NACs at 25 °C.

Models	Parameters	Samples	
		NAC-650-650	NAC-650-700
Pseudo-first-order model	$q_e/(mmol\ g^{-1})$	2.63	2.59
	$k_1/(min^{-1})$	0.1002	0.1022
	$R^2$	0.9981	0.9973
Pseudo-second-order model	$q_e/(mmol\ g^{-1})$	3.38	3.32
	$k_2/(g\ mmol^{-1}min^{-1})$	0.0817	0.0788
	$R^2$	0.9236	0.9402
Avrami $\acute{s}$ fractional-order model	$q_e/(mmol\ g^{-1})$	2.66	2.63
	$k_n/(min^{-1})$	0.0988	0.0999
	n	0.9312	0.8963
	$R^2$	0.9989	0.9993