

## Supplementary information

### **Preparation of highly porous carbon from sustainable $\alpha$ -cellulose for superior performance removal of tetracycline and sulfamethazine from water**

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Table S1 Summary of Sorbate Properties.

Compounds	Chemical formula	Molecular weight	$S_w^a$ (mmol L <sup>-1</sup> )	$\log K_{ow}^b$ (L L <sup>-1</sup> )	pKa
TC	C <sub>22</sub> H <sub>24</sub> N <sub>2</sub> O <sub>8</sub>	444.43	3.8 <sup>1</sup>	-1.19 <sup>1</sup>	3.3(1)
					7.7(2)
					9.7(3) <sup>1</sup>
SMZ	C <sub>12</sub> H <sub>14</sub> N <sub>4</sub> O <sub>2</sub> S	278.33	1.46 <sup>2</sup>	0.89 <sup>2</sup>	2.3(1)
					7.5(2) <sup>2</sup>

<sup>a</sup>  $S_w$  - Water Solubility (25 °C);

<sup>b</sup>  $K_{ow}$  - octanol–water partition coefficient.

<sup>1</sup> J Tolls. Environ. Sci. Technol.35 (2001) 3397-3406.

<sup>2</sup> L Warisara, O Say Kee, T Moorman. Chemosphere 76 (2009) 558-564.

Table S2 Characteristics of  $\alpha$ -cellulose, C $\alpha$ , C $\alpha$ - $\beta$ - $\gamma$ .

Samples	Elemental composition <sup>a</sup> (%)			Yield (wt%)	$S_{BET}^b$ (m <sup>2</sup> g <sup>-1</sup> )	$V_P^c$ (cm <sup>3</sup> g <sup>-1</sup> )	$S_{micro}^d$ (m <sup>2</sup> g <sup>-1</sup> )	$V_{micro}^e$ (cm <sup>3</sup> g <sup>-1</sup> )	$d_{aver}^f$ (nm)
	N	C	H						
<b>C<math>\alpha</math></b>	0.87	60.03	1.21	47.22	26.14	0.042	1.92	0.002	2.769
<b>C<math>\alpha</math>-850-0</b>	0.51	89.12	0.75	59.61	56.34	0.061	12.01	0.013	1.688
<b>C<math>\alpha</math>-850-4</b>	0.41	89.77	0.76	11.41	3187.91	1.781	2655.35	1.407	1.628

<sup>a</sup>: Determined by Vario Micro cube element analyzer.

<sup>b</sup>: BET specific surface area calculated in the relative pressure region  $P/P_o = 0.05 - 0.35$ .

<sup>c</sup>: Total pore volume which is determined at  $P/P_o = 1.0000$ .

<sup>d</sup>: Micropore surface area calculated by the t-plot method.

<sup>e</sup>: Micropore volume calculated by the t-plot method.

<sup>f</sup>: Average pore diameter obtained from DFT equation using N<sub>2</sub> isotherms.

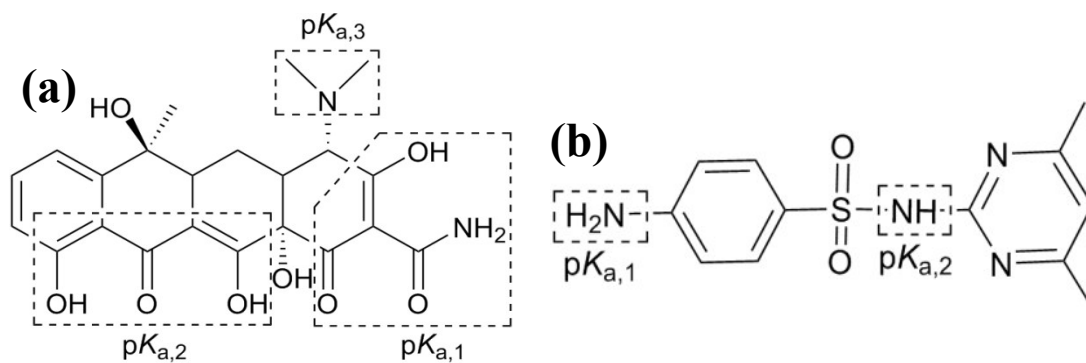


Fig. S1 Chemical structures of tetracycline and sulfamethazine. The regions framed by dashed lines represent the structural moieties associated with the acidic dissociation constants ( $pK_a$ ).

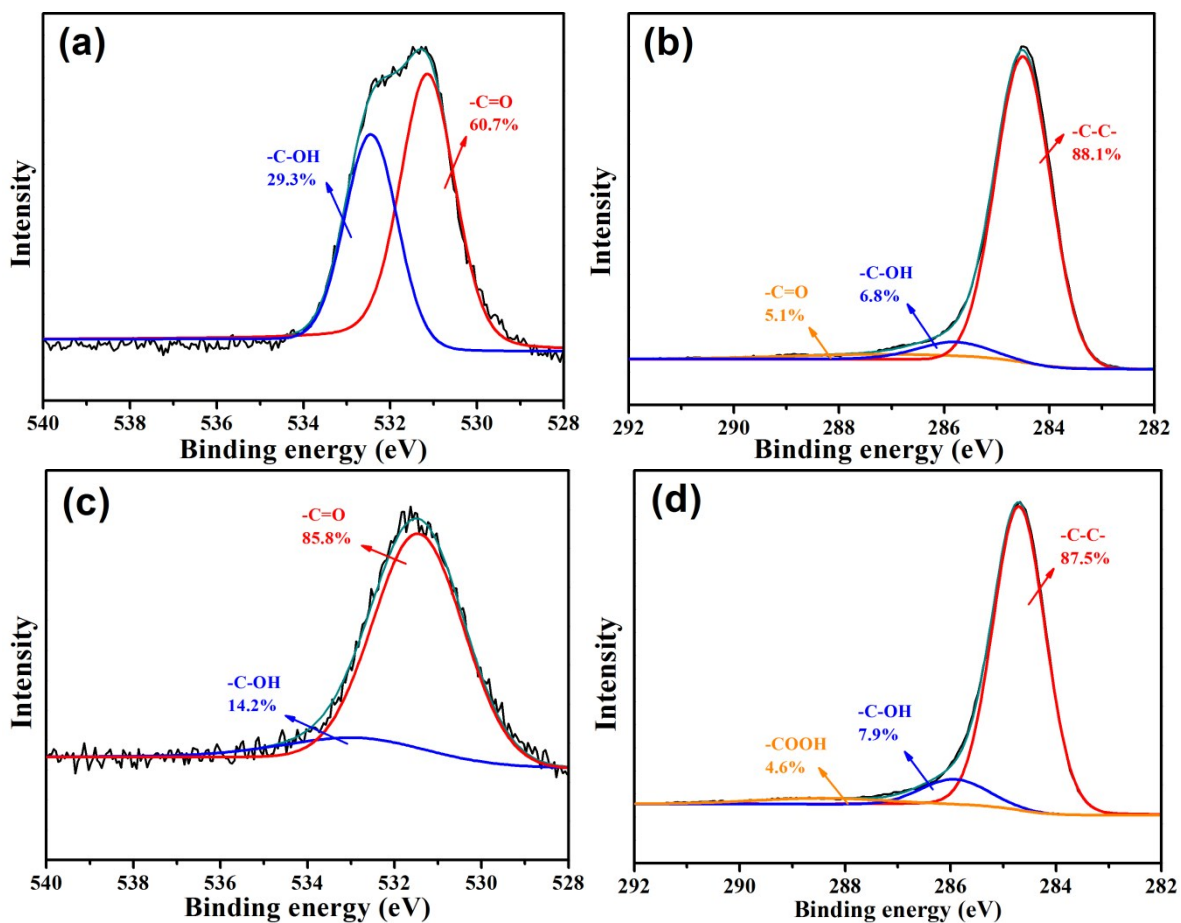


Fig. S2 High-resolution XPS spectra of (a) O1s and (b) C1s peaks of Cα-850-4.