Bamboo-like carbon nanotubes derived from colloidal polymer
nanoplates for efficient removal of Bisphenol A

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Fig. S1. a) SEM and TEM b) images of the PEI-MCA polymer.

Fig. S2. a) XPS survey of the b-CNTs, indicating the presence of C, N, O and Fe elements; b) Fe 2p XPS spectrum.

Fig. S3. a) Pseudo-first-order and b) Pseudo-second-order kinetic plots for BPA
adsorption onto b-CNTs.

**Fig. S4.** Linear plot of ln $K^o$ vs. $1/T$ for the adsorption of BPA on b-CNTs at 293, 303 and 313 K.

**Table S1** Adsorption kinetic parameters of BPA onto b-CNTs.

<table>
<thead>
<tr>
<th>Initial conc. $C_0$ (mg·L$^{-1}$)</th>
<th>Pseudo-first-order</th>
<th>Pseudo-second-order</th>
<th>$R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$K_1$ (min$^{-1}$)</td>
<td>$Q_{e,cal}$ (mg/g)</td>
<td>$Q_{e,cal}$ (mg/g)</td>
</tr>
<tr>
<td>70</td>
<td>0.007</td>
<td>24.39</td>
<td>0.689</td>
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Thermodynamics

The distribution coefficient ($K_d$) was calculated by the following formula:

$$K_d = \frac{C_0 - C_e}{C_e} \times \frac{V}{m}$$  \hspace{1cm} (1)

where $C_0$ (mg/L) is the initial concentration and $C_e$ (mg/L) is the equilibrium concentration of BPA after adsorption, $V$ is the solution volume (L), and $m$ is the mass of the adsorbent (g). $K^0$ is the thermodynamic equilibrium constant, and the values of $\ln K^0$ are obtained by plotting $\ln K_d$ as a function of $C_e$ and extrapolating $C_e$ to zero. Linear plot of $\ln K^0$ vs. $1/T$ for the adsorption of BPA on b-CNTs at 293, 303 and 313 K is shown in Fig. S4.

The value of the Gibbs free energy change ($\Delta G^0$) was calculated by the following equation

$$\Delta G^0 = -RT \ln K^0$$  \hspace{1cm} (2)

$R$ is the universal gas constant (8.314 J/mol·K) and $T$ is temperature (K). The changes of enthalpy ($\Delta H^0$) and entropy ($\Delta S^0$) changes can be estimated by Van’t Hoff equation:

$$\ln K^0 = -\frac{\Delta H^0}{RT} + \frac{\Delta S^0}{R}$$  \hspace{1cm} (3)

The plot of $\ln K^0$ vs. $1/T$ gives a straight line in Fig. S4 with slope and intercept corresponding to $-\Delta H^0/R$ and $\Delta S^0/R$, respectively. The calculated thermodynamic parameters are listed in Table 2.