

Supplementary Information

**Silkworm cocoon derived N, O-codoped hierarchical porous carbon
with ultrahigh specific surface area for efficient capture of methylene
blue with exceptionally high uptake: kinetics, isotherm, and
thermodynamics**

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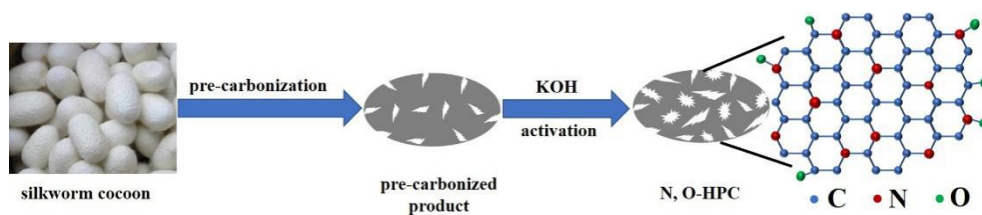
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Scheme S1 Schematic illustration of the strategy for the fabrication of N, O-HPC.

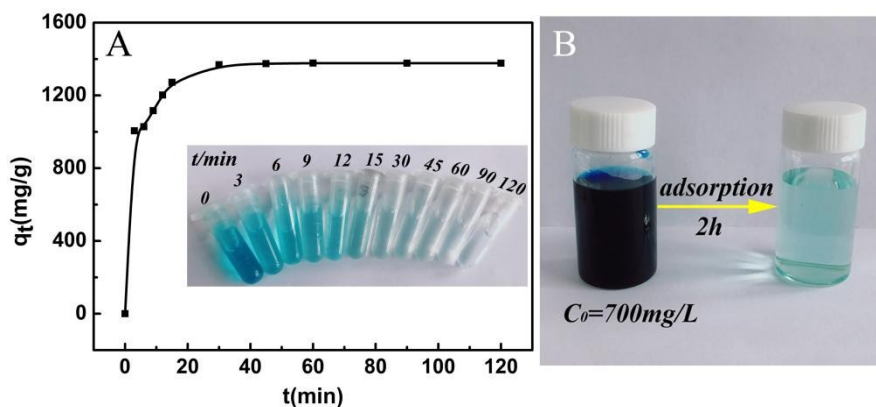


Fig. S1 (A) Effect of contact time on the adsorption of MB onto N, O-HPC (Inset: photographs of MB solutions after various contact time, and all the solutions were diluted 33 times.); (B) Photographs of MB solution before and after adsorption. ($[\text{MB}] = 700 \text{ mg/L}$, adsorbent dosage = 0.05g, 293K)

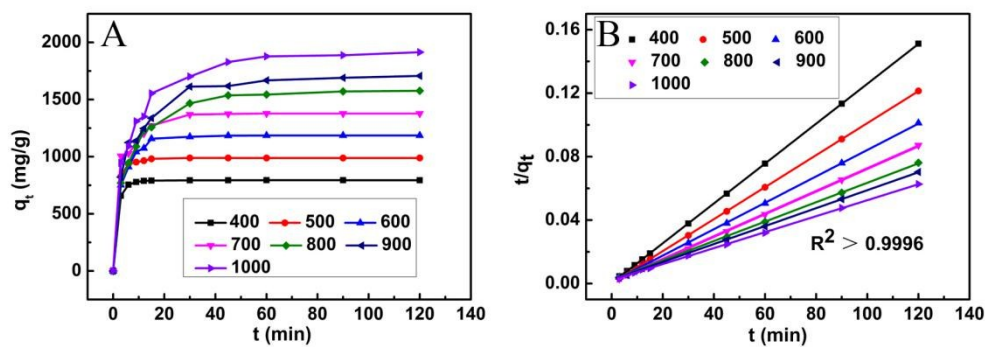


Fig. S2 (A) Effect of initial MB concentration on the adsorption capacity of MB onto N, O-HPC (adsorbent dosage = 0.05g, 293K), (B) corresponding pseudo-second order model fits.

Table S1 Comparison of MB maximum adsorption capacities by some other adsorbents reported in literature.

Adsorbents	Adsorption capacity (mg/g)	Reference
Fe ₃ O ₄ -wheat straw	1374.6	[S1]
Straw activated carbon	472.1	[S2]
Activated carbon prepared from coconut husk	434.78	[S3]
Bamboo based activated carbon	454.2	[S4]
'almond shell' activated carbon	833.3	[S5]
activated carbon produced from flamboyant pods (<i>Delonix regia</i>)	889.58	[S6]
Montmorillonite	289.12	[S7]
Dead macro fungi (<i>Fomes fomentarius</i>)	232.73	[S8]
Papaya seeds	555.55	[S9]
Jackfruit peel	285.71	[S10]

Spent tea leaves	300.05	[S11]
iron terephthalate (MOF-235)	187	[S12]
MIL-100(Fe)	1105	[S13]
NH ₂ -MIL-101(Al)	762	[S14]
MIL-100(Cr)	645.3	[S15]
MIL-100(Fe)	736.2	[S15]
M-CHAP/GO	546.4	[S16]
fish-scale-based hierarchical lamellar porous carbon	1050.72	[S17]
HIO@MgSi nanorods	2020.2	[S18]
N,O-HPC	2104.29	This work

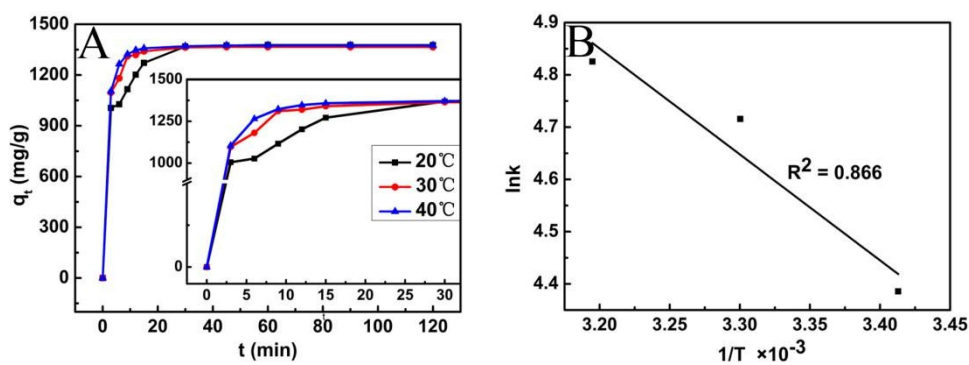


Fig. S3 (A) Effect of temperature on the adsorption capacity of MB onto N,O-HPC ([MB] = 700 mg/L, adsorbent dosage = 0.05g), inset: enlargement (0-30min). (B) Van't Hoff plot for the adsorption of MB by N, O-HPC.

Table S2 Thermodynamic parameters for the adsorption of MB onto N, O-HPC.

T (K)	ΔG^0 (kJ/mol)	ΔH^0 (kJ/mol)	ΔS^0 (J/mol K)
293.15	-10.78	16.85	94.25
303.15	-11.72		
313.15	-12.66		

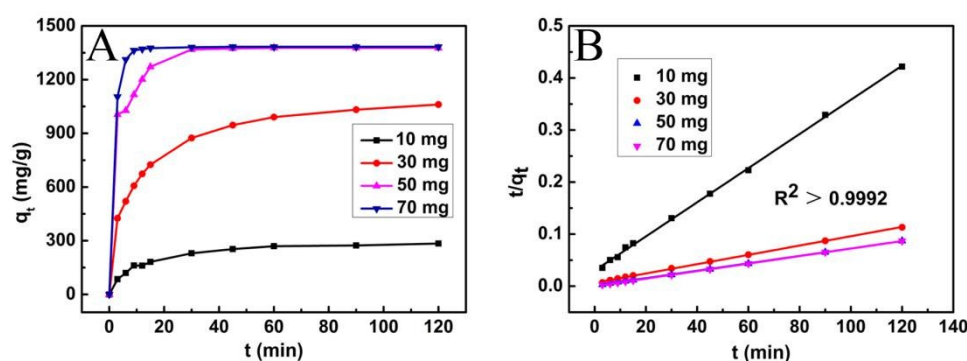


Fig. S4 (A) Effect of adsorbent dosage on the adsorption capacity of MB onto N, O-HPC ([MB] = 700 mg/L, 293K), (B) corresponding pseudo-second order model fits.

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