

Supporting Information

Porous Organic Nanofiber Polymers as Superfast Adsorbents for Capturing Pharmaceutical Contaminants in Water

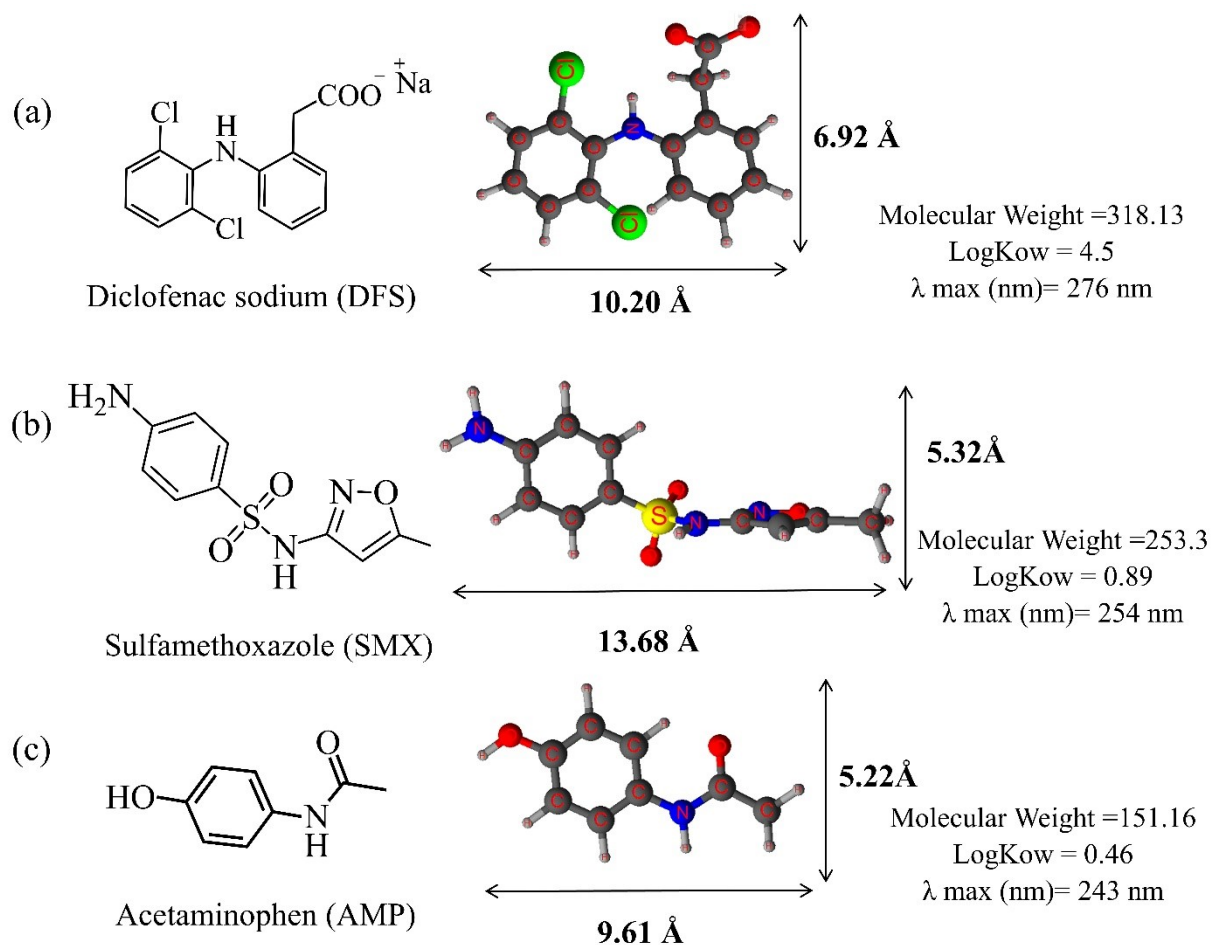
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Scheme S1. Chemical and structural characteristics of PPCP compounds:^{1,2} a) DFS; b) SMX; c) AMP. Optimized 3D structures drawn by ChemSketch software are also displayed along with their molecular dimensions. For DFS, Na⁺ ion was removed considering its ionic state in aqueous solution.

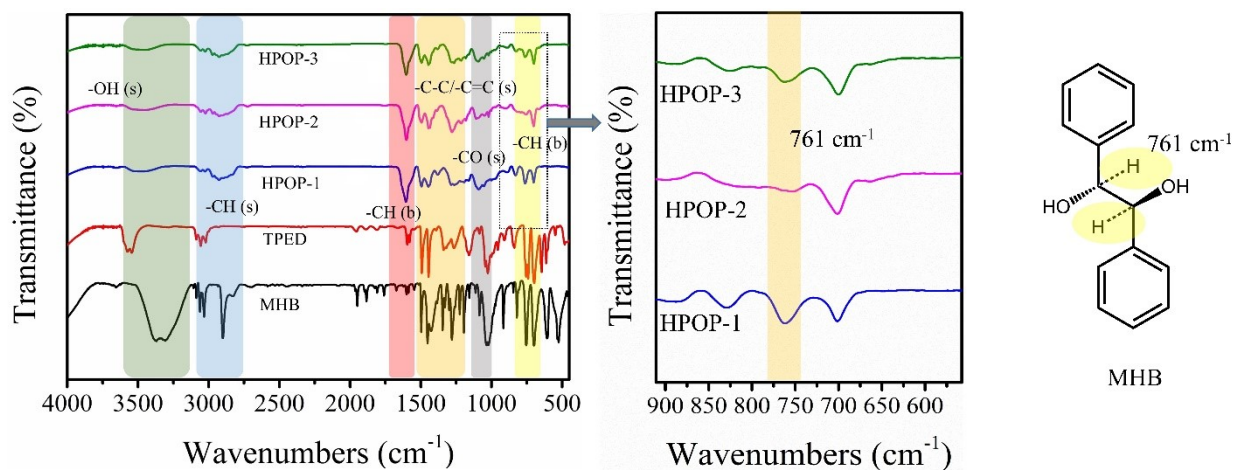


Fig. S1. FTIR spectra and CH bending mode vibrations of the HPOPs.

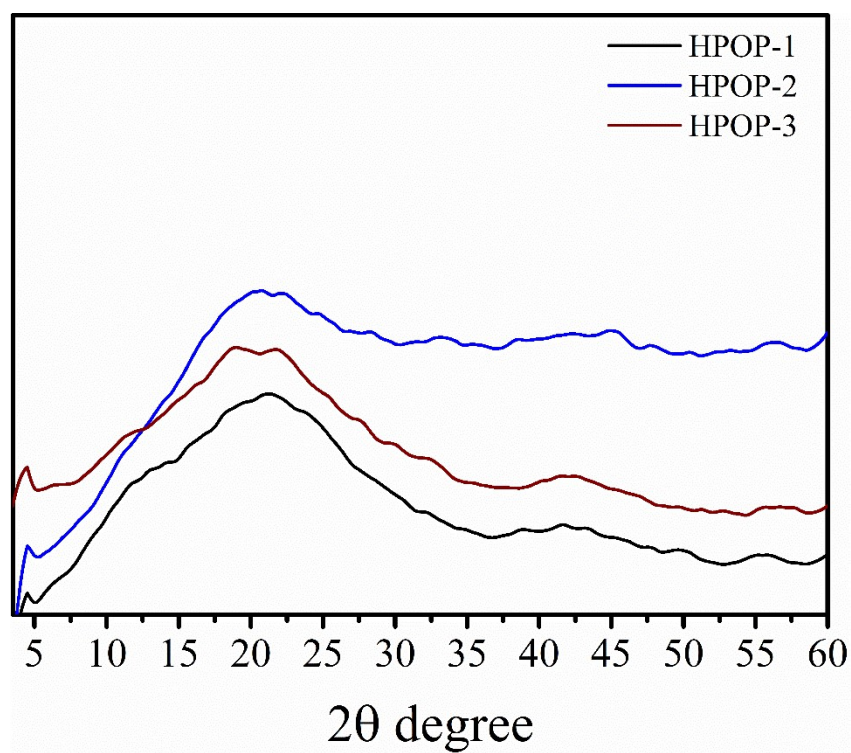


Fig. S2. PXRD pattern of of HPOP-1, -2, and -3

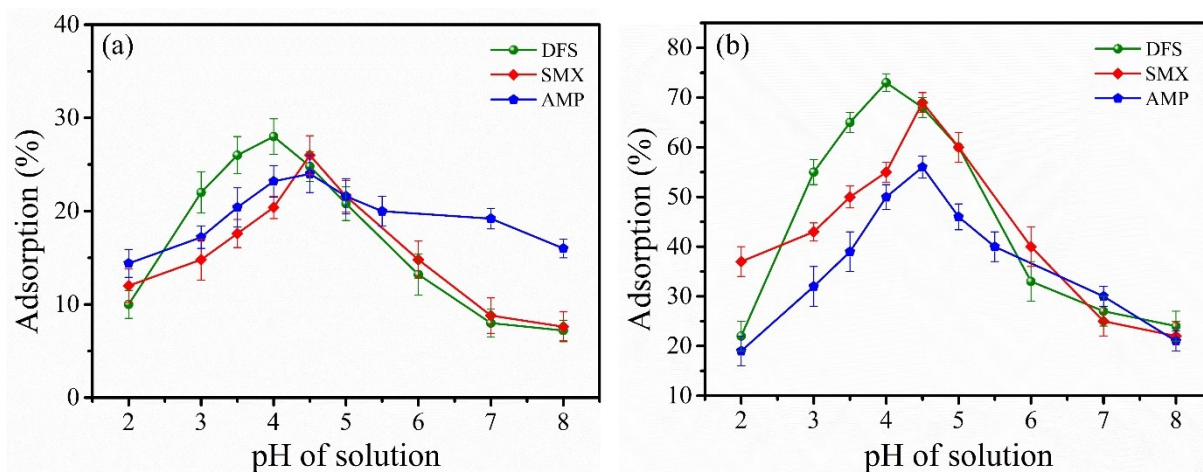


Fig. S3. Effect of pH on DFS, SMX, and AMP removal: (a) HPOP-1; (b) HPOP-2.

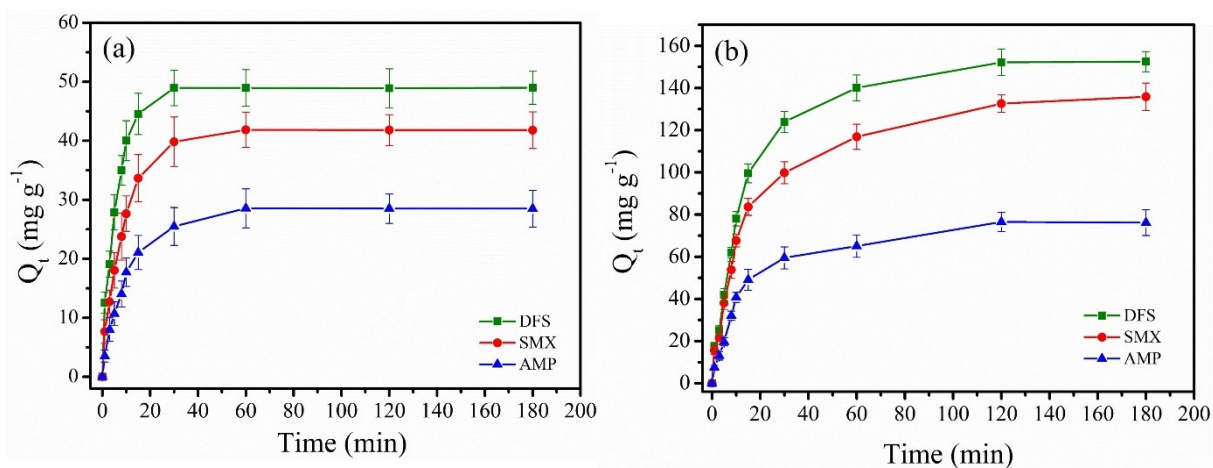


Fig. S4. Adsorption kinetics of DFS, SMX, and AMP on (a) HPOP-1 and (b) HPOP-2.

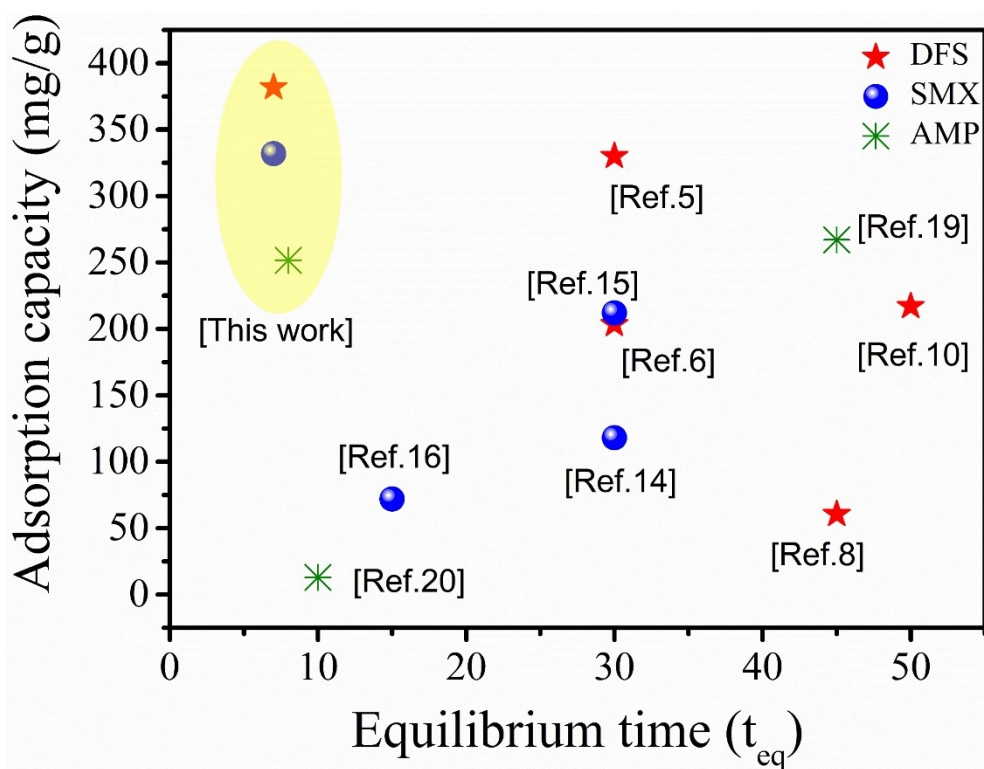


Fig. S5. Comparisons of equilibrium time vs. adsorption capacity for PPCP adsorption in PONF and previously reported benchmark materials. For each material, the equilibrium time (t_{eq}) was determined to be the time to reach 95% of the saturated adsorption capacity.

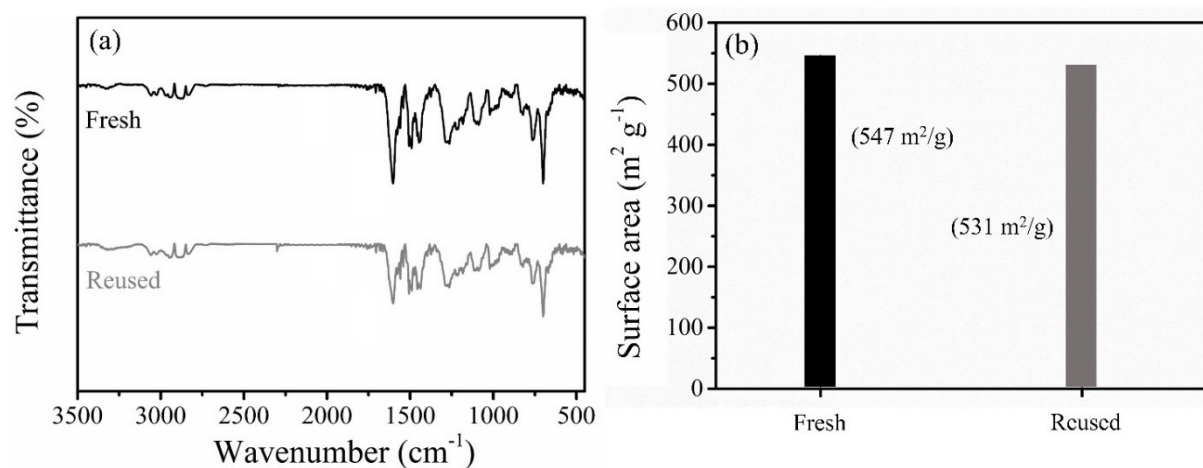


Fig. S6. (a) FTIR spectra and (b) BET surface areas of PONF before and after SMX adsorption.

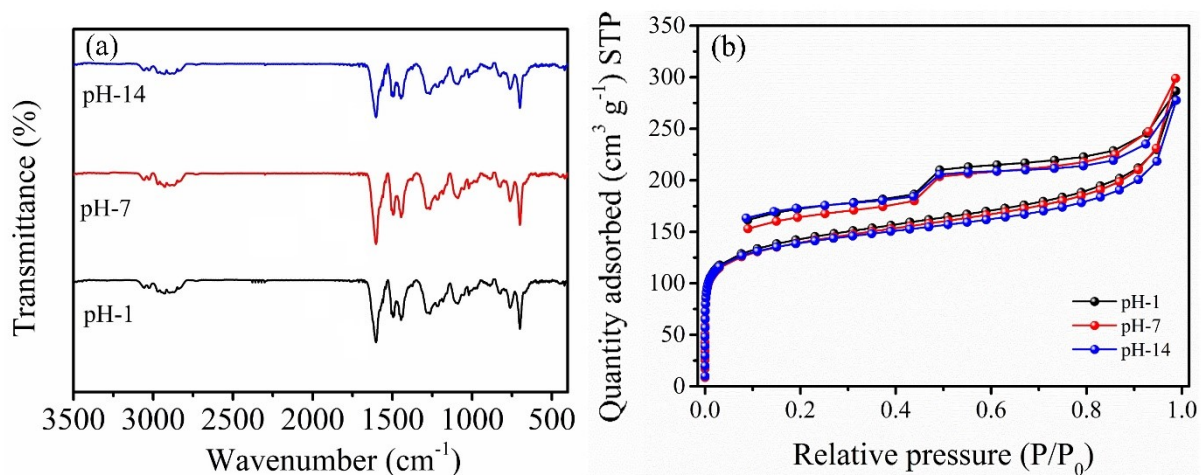


Fig. S7. Effect of PONF exposure to different pH conditions for 72 h: a) FTIR spectra; b) N₂ adsorption-desorption isotherms at 77 K.

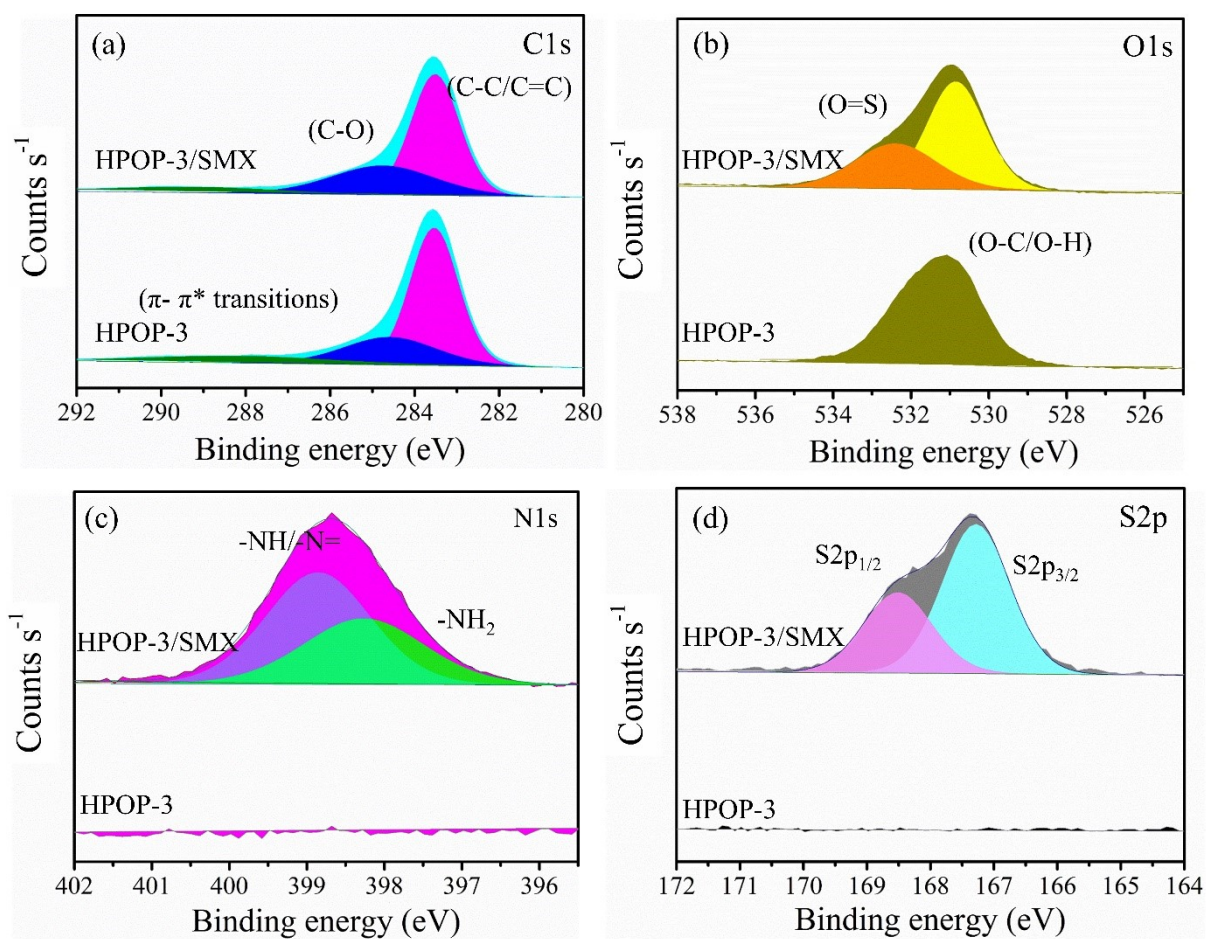


Fig. S8. (a) C 1s, (b) O 1s, (c) N 1s, and (d) S 2p XPS binding energy peaks of PONF before and after SMX capture.

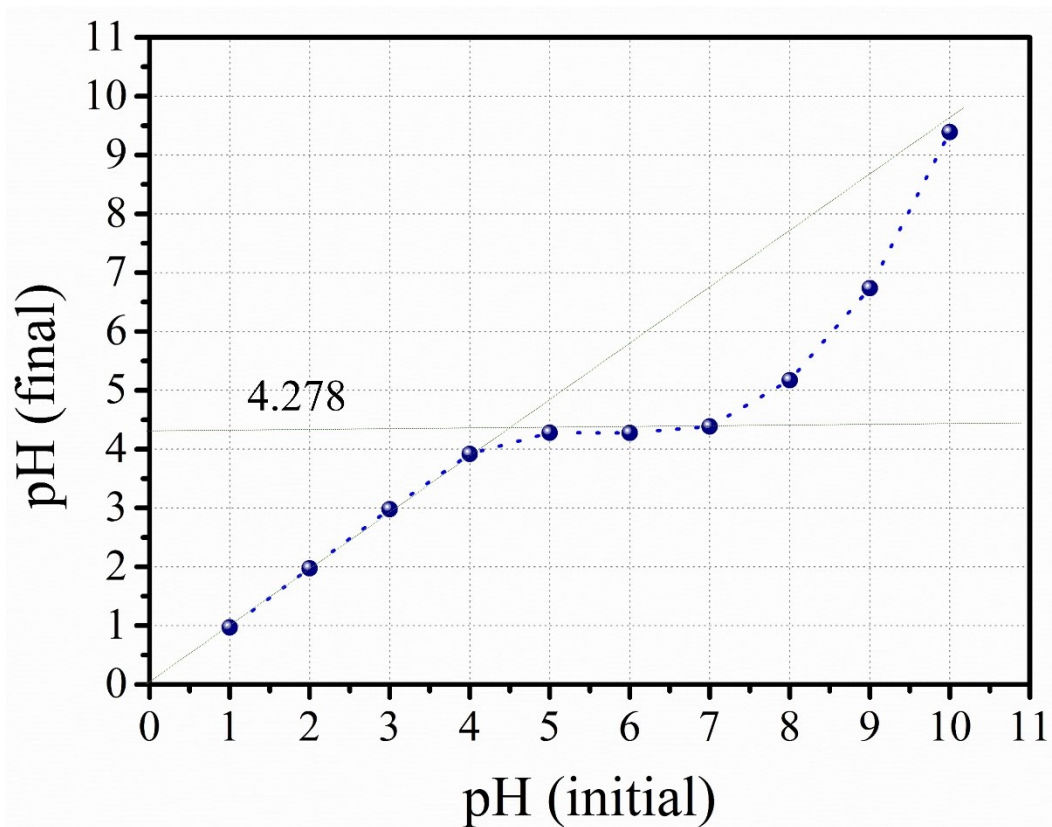


Fig. S9. Determination of pH_{pzc} of PONF by the pH drift method.

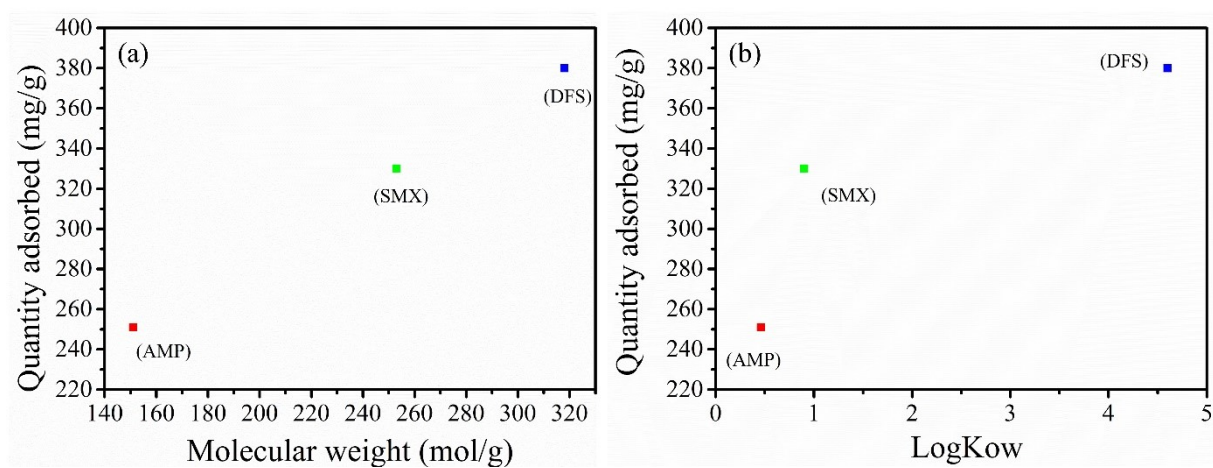


Fig. S10. Adsorption quantity relationship with the physicochemical characteristics of PPCP: (a) molecular weight; (b) LogKow.

Table S1. Equilibrium isotherm parameters of DFS, SMX, and AMP adsorption on PONF.

PPCP	Langmuir adsorption isotherm			Freundlich adsorption isotherm		
	q_m [mg.g ⁻¹]	K_L [L.mg ⁻¹]	R^2	K_F [mg.g ⁻¹]	n	R^2
DFS	380.8	2.064	0.979	186.9	3.200	0.833
SMX	331.9	2.125	0.930	173.5	3.770	0.760
AMP	251.6	2.496	0.932	144.4	4.815	0.686

Table S2. Comparison of adsorption capacities of the various reported benchmark materials for PPCP removal from water.

Adsorbent	Adsorbed amount (Q_m) [mg g ⁻¹] ^a			Adsorption mechanism	Ref
	DFS	SMX	AMP		
ZIF-8	100	-	-	Hydrogen bonding	3
PCDM	400	-	-	Hydrogen bonding	
ZCPC	159.6			Anion exchange and partitioning	4
Expanded graphite	330	-	-	Hydrophobicity and energetically uniform carbon surface	5
OH-MCOF	203.4	-	-	π - π , hydrophobic and CH- π interactions	6
CNT/Al ₂ O ₃	27	-	-	π - π and van der Waals forces	7
CTAB-ZIF-67	60.5	-	-	Electrostatic and Lewis acid–base interactions	8

Commercial AC	76	-	-	Electrostatic	9
OAC	487	-	-	Electrostatic and H-bonding	9
P-POP	217	-	-	H-bonding, π - π , and van der Waals forces	10
Graphene	-	239.0	-	π - π interactions	11
MCTP	-	483	-	π - π interactions	12
Activated carbon	-	259	-	-	
Biochar	-	19.0	-	Electrostatic attractions	13
Carbon PBFG4	-	118	-	π - π interactions	14
CuZnFe ₂ O ₄ -biochar	-	212	-	H-bonding, hydrophobic, and π - π electron donor-acceptor interactions	15
PAC14-Vt	-	72	-	π - π and NH- π interactions	16
Polymeric resin	-	-	6.9	Hydrogen bonds and Van der Waals forces	17
Biomass-AC	-	-	100	π - π interactions	18
Wood carbon	-	-	267	Dispersive forces	19
Graphene	-	-	12.98	π - π interactions and Van der Waals forces	20
HPOP-3 or PONF	380.8	331.9	251.6	Hydrogen bonds and hydrophobic, π - π interactions, and Van der Waals forces	This work

^a The amount of PPCPs adsorbed is the monolayer adsorption capacity (Q_m) obtained from Langmuir model.

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