

Procedure of the repeatability analysis of TFPB-Pa-SO₃H COF and TFPB-BDSA COF

To aqueous dye solution (20 mg·L⁻¹, 10 mL) were added 5 mg of TFPB-Pa-SO₃H COF and TFPB-BDSA COF, and the mixture was stirred for 24 hours at room temperature. After the adsorption is completed, the adsorbent is separated by centrifugation and dried for later use. The mixture was then washed with HCl (mg·L⁻¹) in ethanol as the eluent and stirred at room temperature with dye-adsorbed TFPB-Pa-SO₃H COF and TFPB-BDSA COF for 2 h for the dye desorption experiment. The adsorbent was collected by filtration and dried at 100°C for 6 hours. The above experimental steps were repeated 5 times.

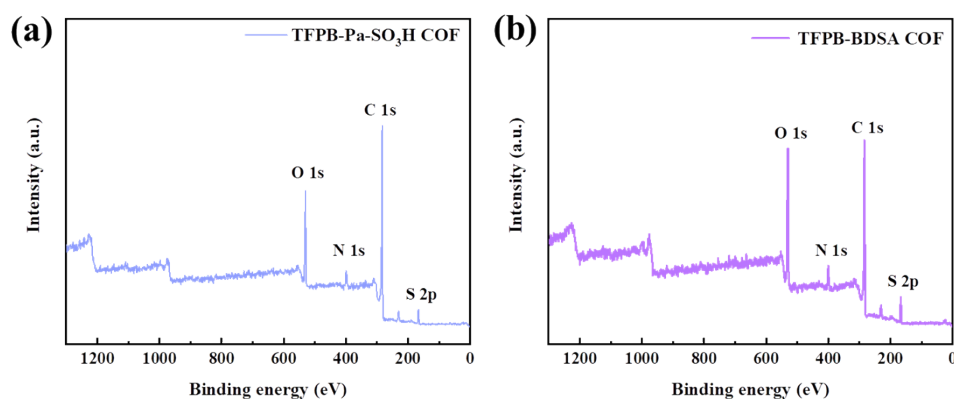


Fig. S1 XPS fully scanned spectra of TFPB-Pa-SO₃H COF (a) and TFPB-BDSA COF (b).

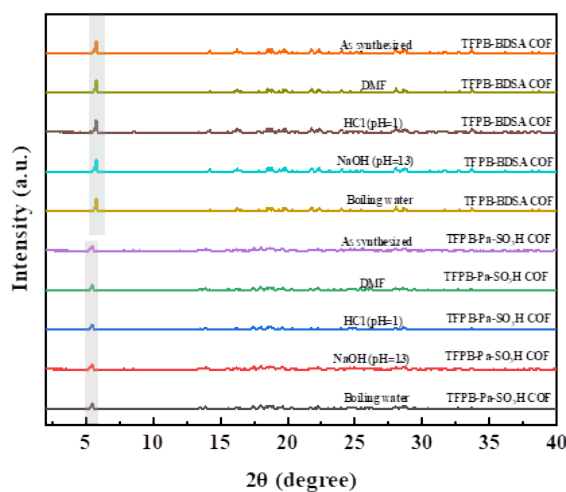


Fig. S2 PXRD patterns of TFPB-Pa-SO₃H COF and TFPB-BDSA COF treated with different conditions.

Table S1 The binding energies and relative element contents for TFPB-Pa-SO₃H COF and TFPB-BDSA COF.

	TFPB-Pa-SO ₃ H COF		TFPB-BDSA COF	
	Binding energy	Atomic(%)	Binding energy	Atomic(%)
N 1s	398.50	5.96	400.00	5.81
C 1s	283.27	75.95	283.79	67.17
O 1s	530.21	14.77	530.54	21.71
S 2p	166.37	3.32	167.04	5.31

Table S2 The adsorption capacities of different adsorbents and prepared in this work for some dyes.

Adsorbents	Dyes	q_e (mg·g ⁻¹)	Reference
Acid-Functionalized Bentonite	MB	266	[46]
MoS ₂	RhB	291	[47]
AA2-alk-MXene adsorbent	MB	193	[48]
CoF/GO	MB	157	[49]
Benzodimidazole-COF	MB	185	[50]
COF-TPDD-COOH	CV	88	[51]
	MLB	1174	
	TFPB-Pa-SO ₃ H COF	CV	1559
TFPB-BDSA COF	RhB	1062	
	MLB	1166	
	CV	1288	This work
	RhB	1054	

Table S3 Detection of MLB, RhB and CV on TFPB-Pa-SO₃H COF in Real Samples.

Real water samples	Dyes	Added (ug·mL ⁻¹)	Calculated (ug·mL ⁻¹)	Recovery (%)	RSD (n=3)
Industrial wastewater	MLB	0.90	0.940	104.40	4.7
		0.50	0.489	97.80	4.4
		0.060	0.053	87.72	3.5
	RhB	0.90	0.934	103.78	4.5
		0.50	0.507	101.40	4.4
		0.060	0.054	90.00	3.1
	CV	0.90	0.846	94.74	3.2
		0.50	0.465	93.63	3.7
		0.060	0.056	93.34	3.6
MLB	0.90	0.812	90.22	3.2	
	0.50	0.444	88.80	2.9	
	0.060	0.053	88.33	2.6	
Tap water	RhB	0.90	0.773	85.88	3.4
		0.50	0.460	92.07	4.1
		0.060	0.054	90.84	3.5

		0.90	0.846	94.62	3.4
	CV	0.50	0.465	93.00	2.3
		0.060	0.052	86.67	1.7
		0.90	0.892	99.11	4.2
	MLB	0.50	0.457	91.40	2.5
		0.060	0.057	95.86	2.9
		0.90	0.857	95.25	4.0
River water	RhB	0.50	0.453	90.60	4.1
		0.060	0.053	88.33	3.7
		0.90	0.826	91.78	3.1
	CV	0.50	0.484	96.80	3.8
		0.060	0.053	88.34	3.9
