Supporting information

Synthesis of an Anion Exchange Resin for Enhanced PFAS Adsorption in Water Treatment

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Table S1. The specific quantities of the monomer, crosslinker, porogen, AOT, and APS for synthesis of ion exchange resins.

Resin	APTMAC	DADMAC	Bis-AAM (%) [b]	Porogen (%) [c]	AOT	APS
AR1	41.3 g (75 w/w% aqueous solution) (150 mmol)	-	2.31g (15 mmol) (10 mol%)	16.6 mL (PVOH 10w/w aqueous solution) (5% w/w monomer and Bis-AAM)	0.667 g	0.684g
AR2	41.3 g (75 w/w% aqueous solution) (150 mmol)	-	6.93g (30 mol%)	18.9 mL (PVOH 10w/w aqueous solution) (5% w/w monomer and Bis-AAM)	0.667 g	0.684g
AR3	41.3 g (75 w/w% aqueous solution) (150 mmol)	-	9.25g (40 mol%)	20.1 mL (PVOH 10w/w aqueous solution) (5% w/w monomer and Bis-AAM)	0.667 g	0.684g
DR4	-	37.3 g (65 w/w% aqueous solution) (150 mmol)	2.31g (10 mol%)	13.2 mL (PVOH 10w/w aqueous solution) (5% w/w monomer and Bis-AAM)	0.667 g	0.684g
DR5	-	37.3 g (65 w/w% aqueous solution) (150 mmol)	6.93g (30 mol%)	15.6 mL (PVOH 10w/w aqueous solution) (5% w/w monomer and Bis-AAM)	0.667 g	0.684g
DR6	-	37.3 g (65 w/w% aqueous solution) (150 mmol)	9.25g (40 mol%)	16.7 mL (PVOH 10w/w aqueous solution) (5% w/w monomer and Bis-AAM)	0.667 g	0.684g
DR7	-	37.3 g (65 w/w% aqueous solution) (150 mmol)	2.31g (10 mol%)	-	0.667 g	0.684g

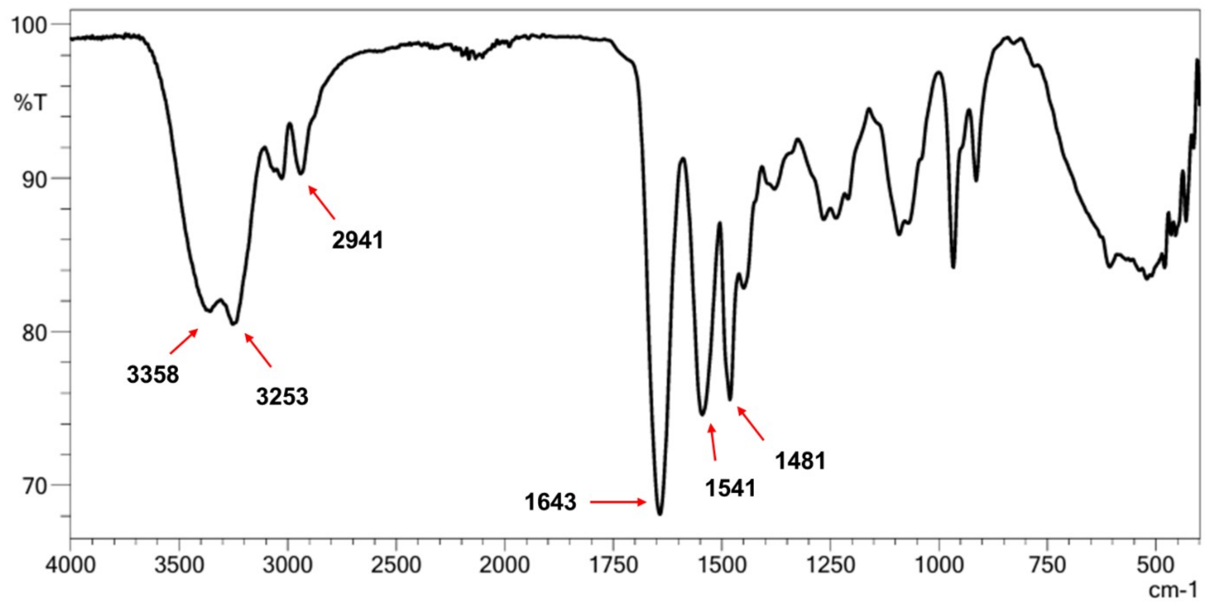

Figure S1. FTIR spectrum of resin AR1.

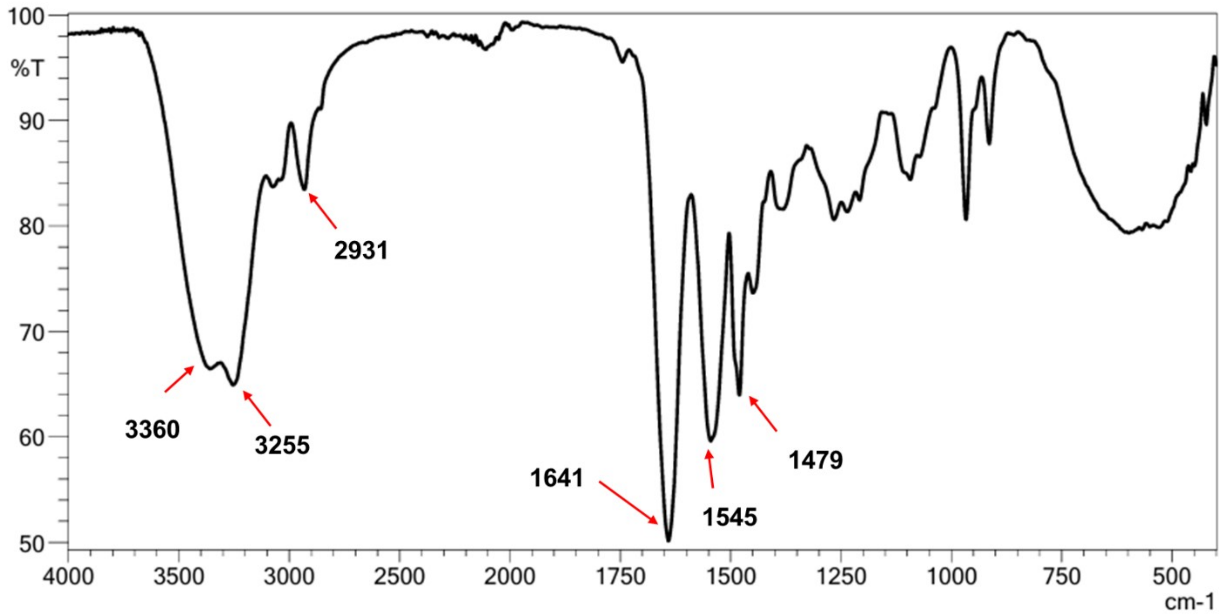

Figure S2. FTIR spectrum of resin AR2.

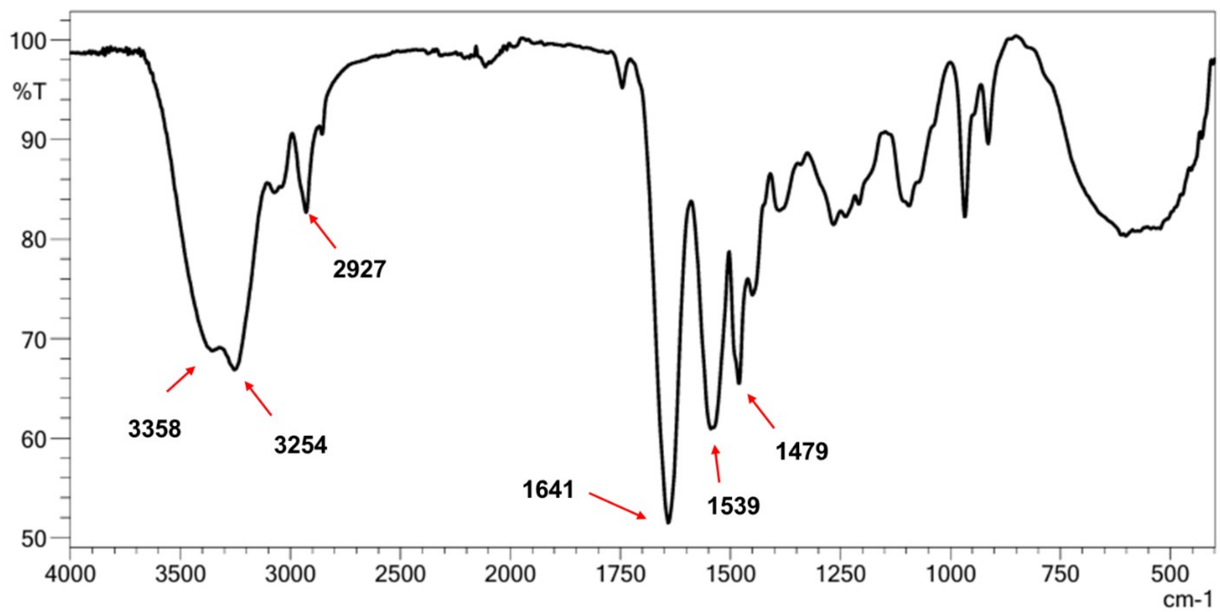

Figure S3. FTIR spectrum of resin AR3.

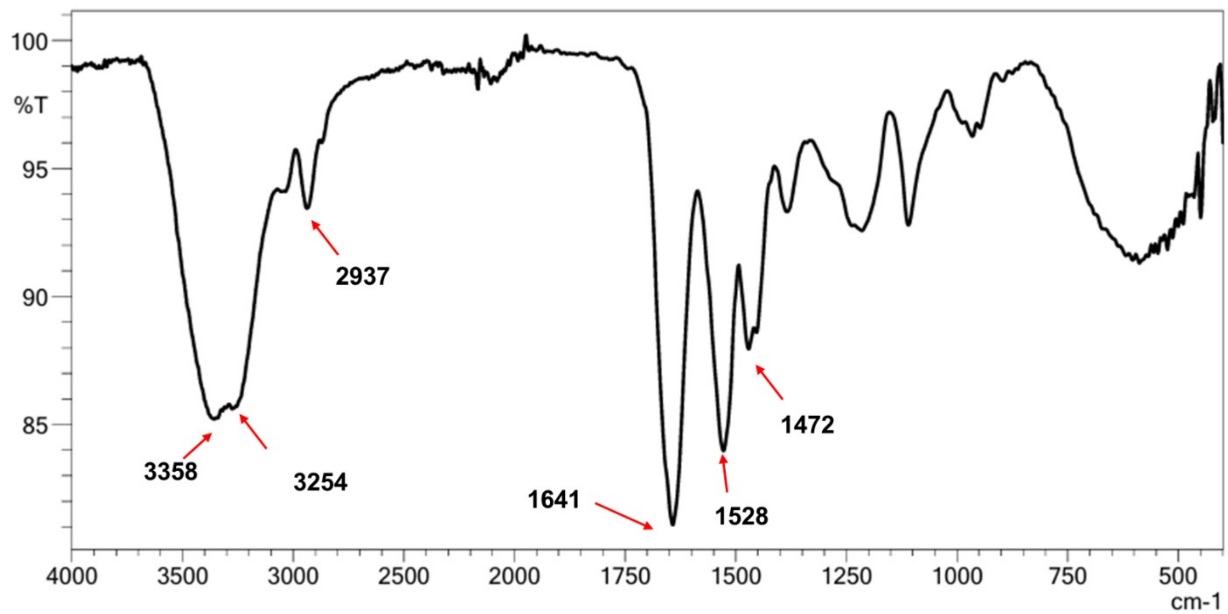

Figure S4. FTIR spectrum of resin DR5.

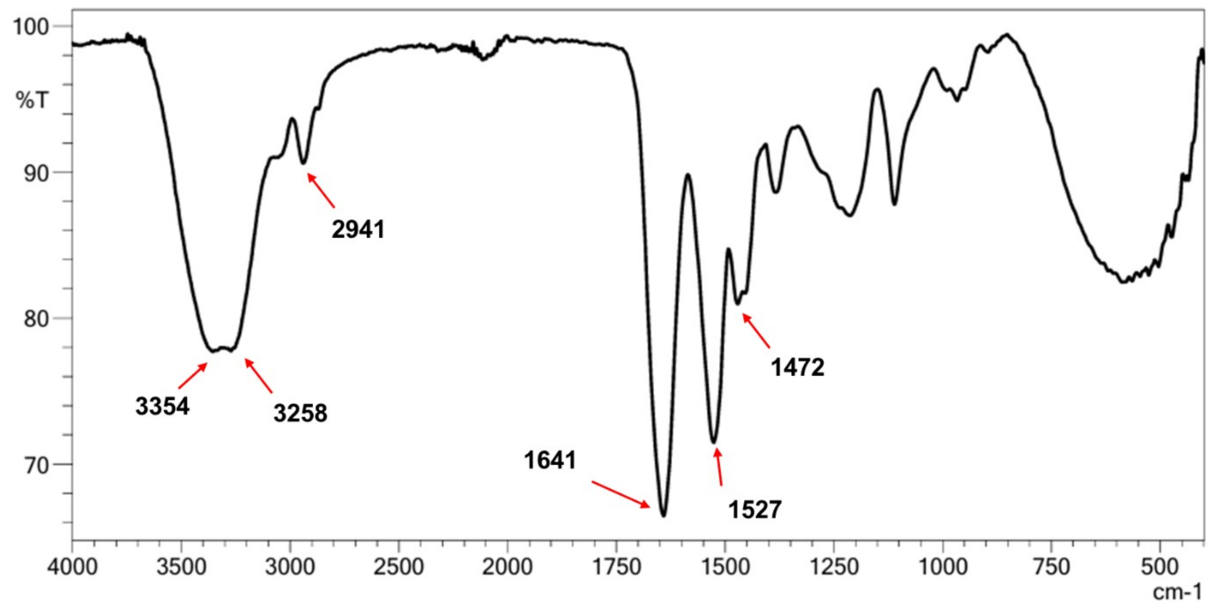

Figure S5. FTIR spectrum of resin DR6.

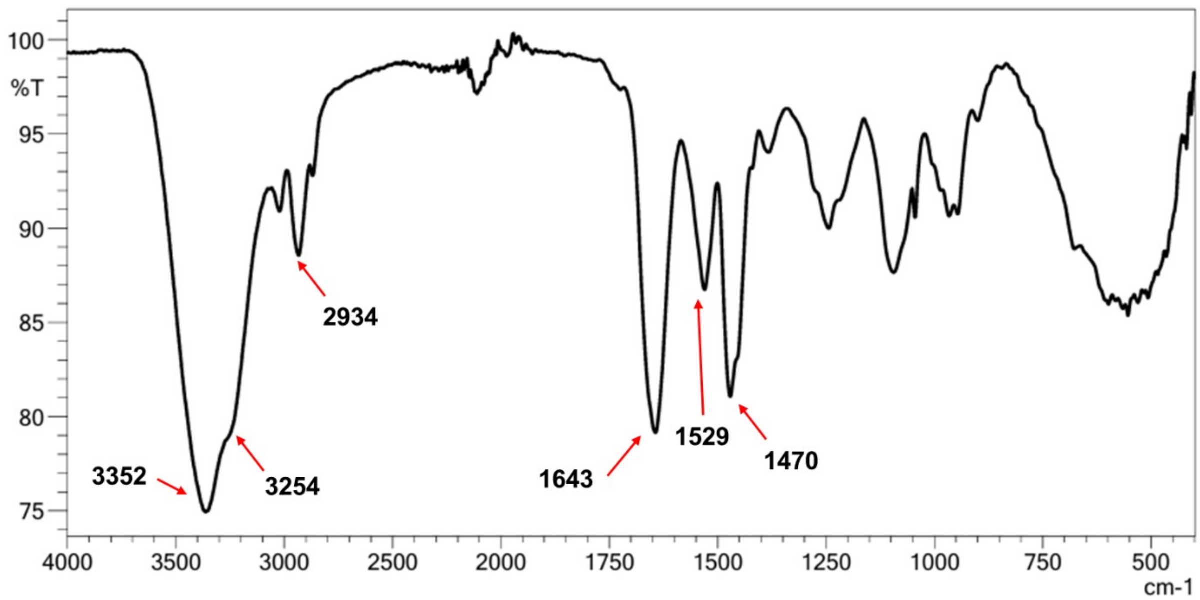

Figure S6. FTIR spectrum of resin DR7.

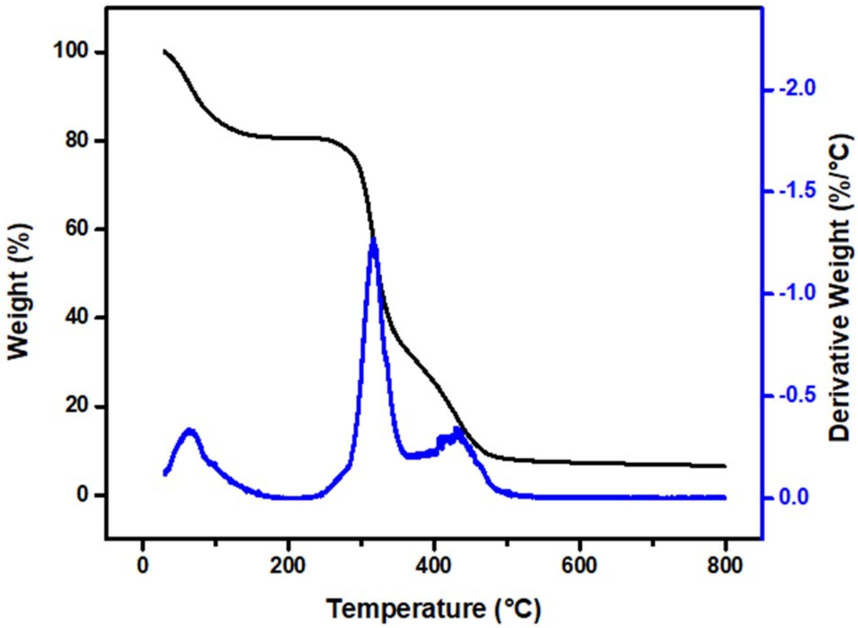

Figure S7. TGA/DTG thermograms of resin AR1**.**

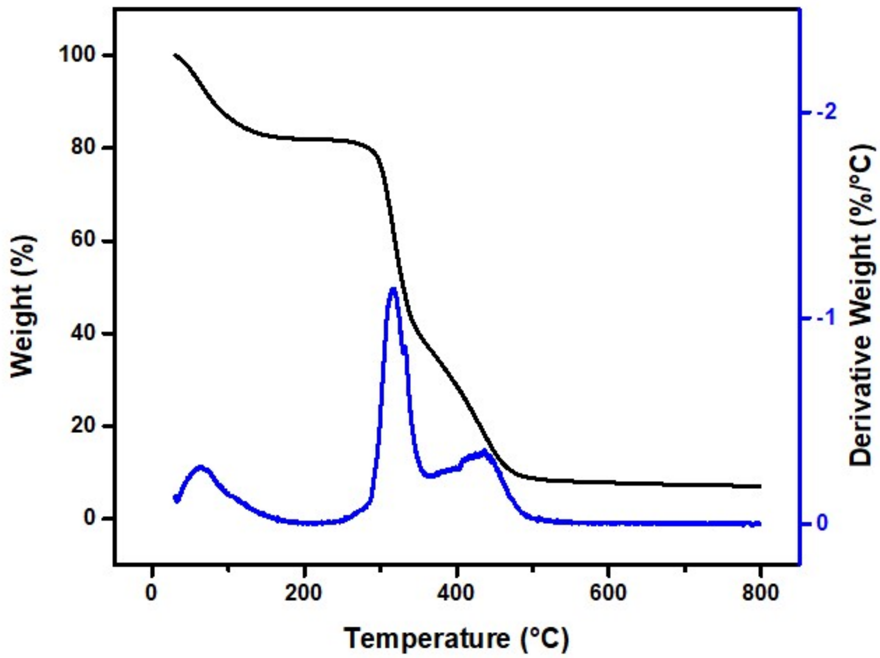

Figure S8. TGA/DTG thermograms of resin AR2.

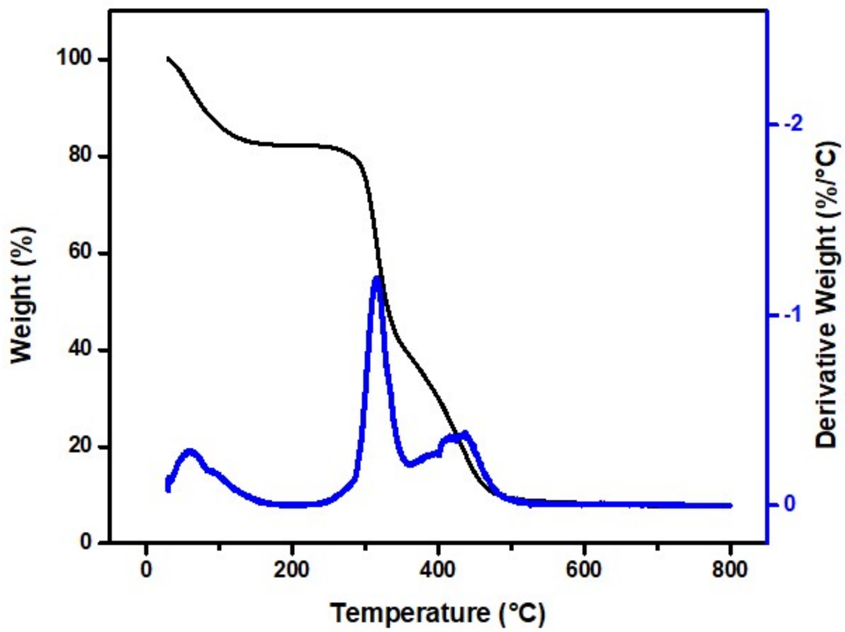

Figure S9. TGA/DTG thermograms of resin AR3.

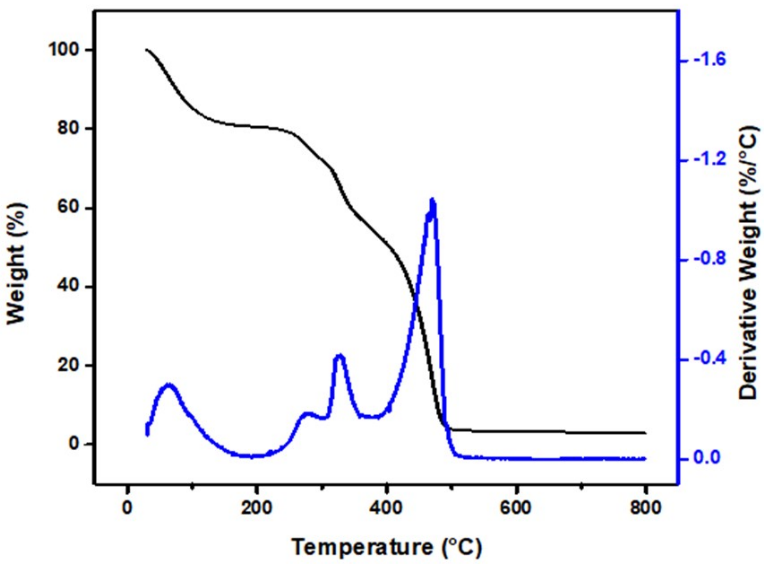

Figure S10. TGA/DTG thermograms of resin DR5.

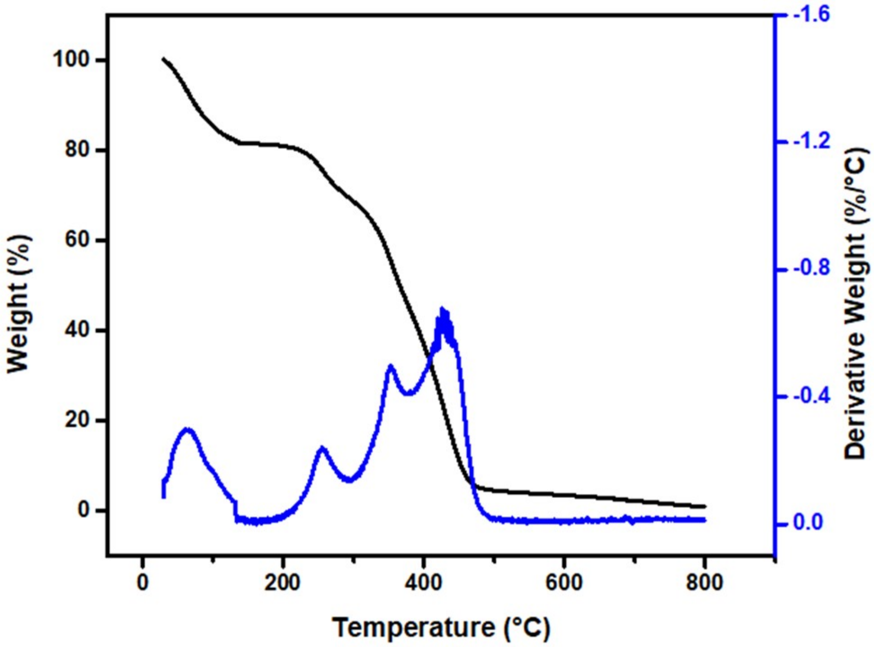

Figure S11. TGA/DTG thermograms of resin DR6.

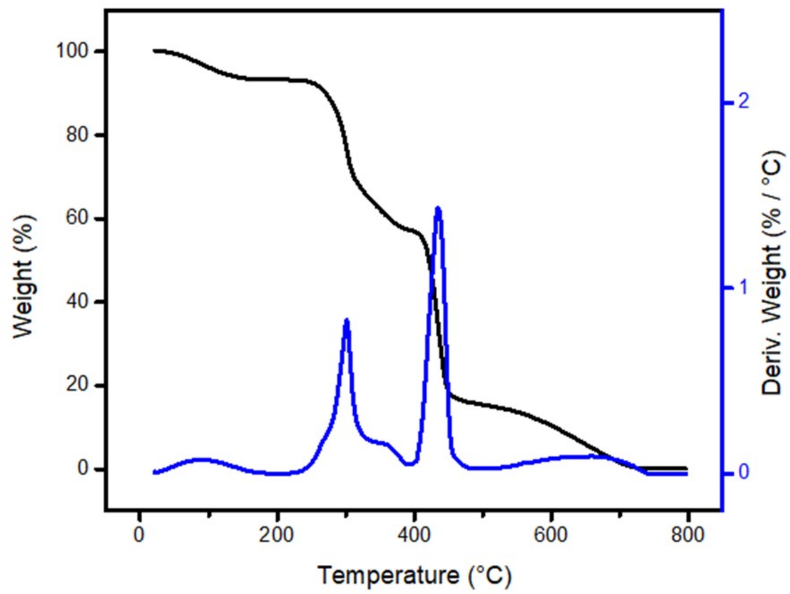

Figure S12. TGA/DTG thermograms of resin DR7.

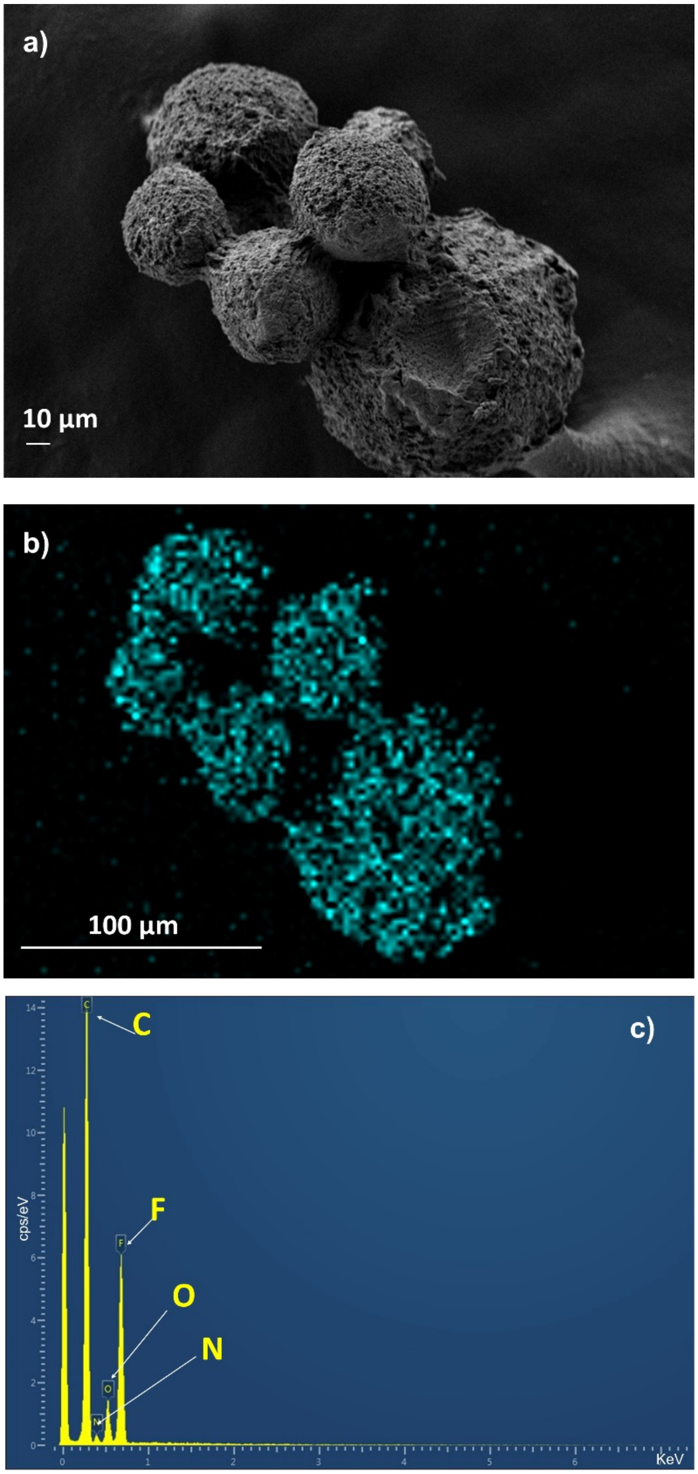

Figure S13. a) SEM image of resin DR4 after PFOA adsorption, b) EDS mapping of florin of resin DR4 after PFOA adsorption, d) EDS Element Spectrum of resin DR4 after PFOA adsorption.

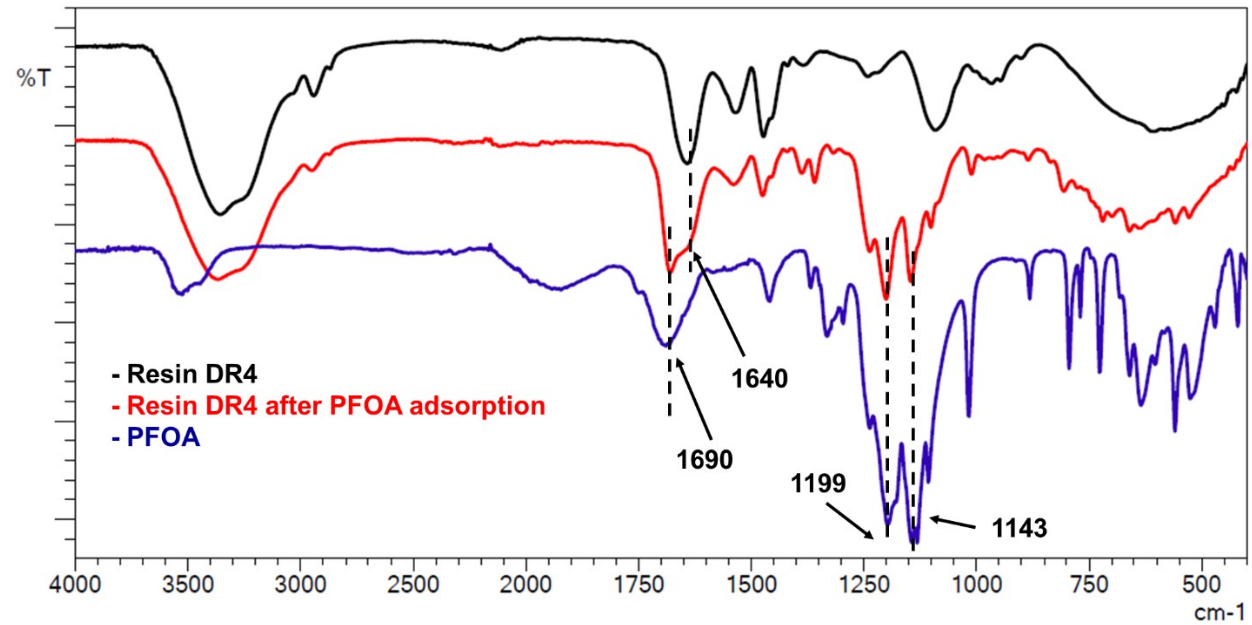

Figure S14. FTIR spectra of resin DR4, resin DR4 after PFOA adsorption, and PFOA.

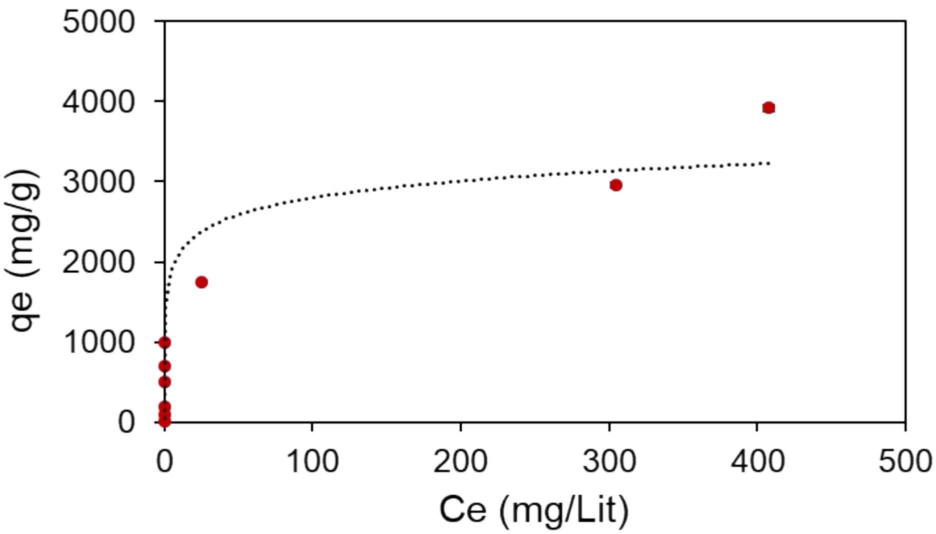

Figure S15. PFOA adsorption isotherm ($[PFOA]_0 = 1-800$ mg L^{-1}; [resin DR4] = 100 mg L^{-1}).

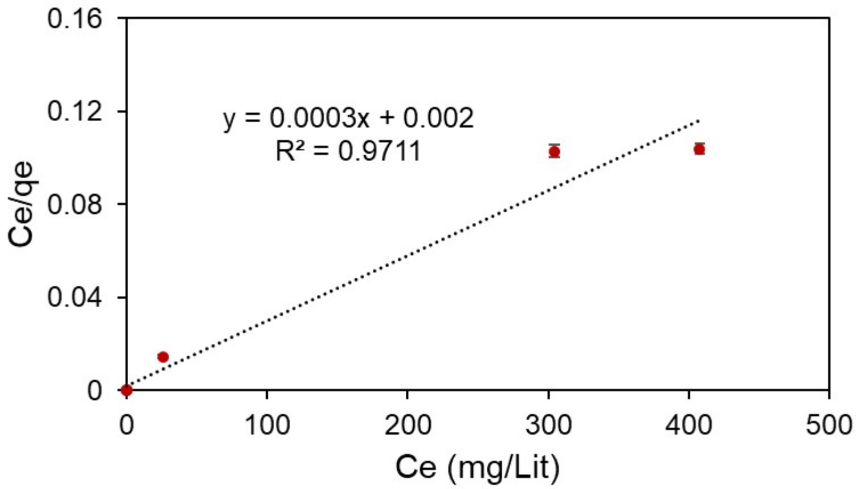

Figure S16. The fitting of the Langmuir isotherm model for resin DR4.

Table S2. Comparison of the adsorption capacity for some adsorbents for removal of PFOA from water.

Entry	Adsorbent	pH	t_e^c (h) [a]	Q_m^e (mg g^{-1}) [b]	Ref.
1	Cystamine-grafted hollow COF	7	48	577	[1]
2	Fluorinated-Squaramide-COF	7	0.25	370	[2]
3	COF-300-methyl	6	18	259	[3]
3	PAF-1-NDMB porous organic polymer	6.8	2	2000	[4]
5	IRA67 resin	4	33.5	1230	[5]
6	IRA910 resin	6	24	1437	[6]
7	Polymer-stabilized ion exchange resin	6	72	1675	[7]
8	Qatarized cotton	5	4	1550	[8]
9	Porous graphite	5	-	366	[9]
10	Mesoporous melamine-formaldehyde resin microsphere	7	24	525	[10]
11	Granular activated carbon	5	120	41	[11]
12	Polyaniline nanotubes	7	-	1100	[12]
13	Ni8-Pyrazolate Porous Framework	7	24	268	[13]
14	Zirconium-Based Metal−Organic Frameworks	-	0.017	507	[14]
15	Polyethyleneimine-balsa wood	3	4	279	[15]
16	Polypyrrole/biochar composites	6	10	1005	[16]
17	Polyethylenimine-polyvinyl chloride nanofiber	3	7	235	[17]
18	FeOCl nanosheets	6	0.16	277	[18]
19	Resin DR4	6	24	3300	This work

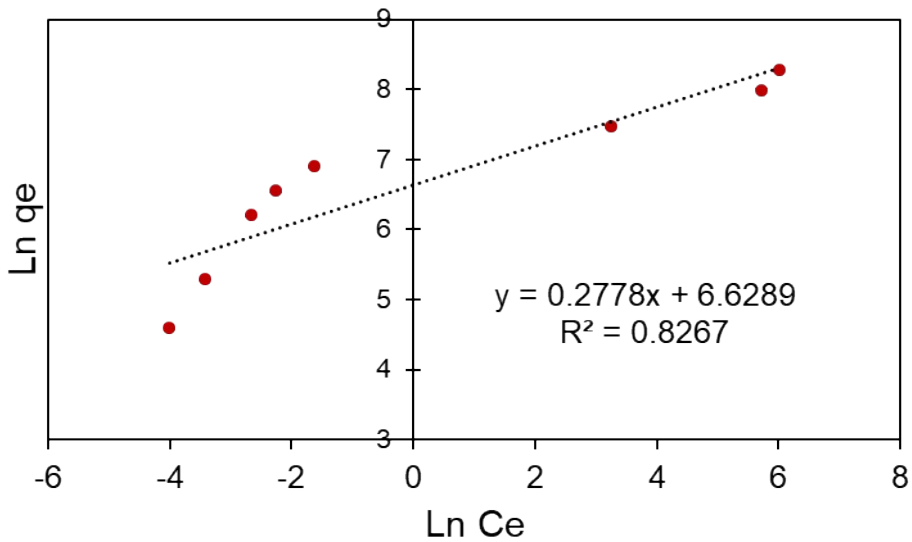

Figure S17. The fitting of the Freundlich isotherm model for resin DR4.

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