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Supporting information for

Regulating preparation of antibacterial poly(amidoxime) for efficient uranium extraction from seawater

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Table S1. Curve fitting results of XPS C 1s spectra.

	Peak	BE[a] (eV)	FWHM[b] (eV)	%
PAO	–C≡N	284.56	0.78	44.5
	C-C	285.24	0.80	31.7
	C–OH	286.34	1.03	15.4
	–C=O	287.30	1.20	5.70
	–C(NH_2)=NOH, -COOH	288.63	1.09	3.30
K_2FeO_4@PAO	-C≡N	284.55	0.76	44.2
	C-C	285.31	0.73	27.5
	C–OH	286.34	0.96	25.1
	–C=O	287.50	0.97	11.6
	–C(NH_2)=NOH, -COOH	288.58	0.50	2.60

a: Binding energy; b: Full width at half-maximum.

Table S2. Curve fitting results of XPS N 1s spectra.

	Peak	BE (eV)	FWHM (eV)	%
PAO	–C≡N	398.68	0.74	11.2
	N-H	399.48	1.17	81.7
	–C(NH_2)=NOH	400.48	0.92	6.89
K_2FeO_4@PAO	–C≡N	398.72	0.69	7.54
	N-H	399.41	1.18	81.6
	–C(NH_2)=NOH	400.38	0.99	10.8

Table S3. Curve fitting results of XPS O 1s spectra.

	Peak	BE (eV)	FWHM (eV)	%
PAO	-COOH	531.21	1.74	48.0
	C=O	532.16	1.06	33.8
	-OH	533.28	1.37	15.8
K_2FeO_4@PAO	-COOH	531.11	1.73	61.5
	C=O	532.28	1.42	24.7
	-OH	533.43	1.79	13.1

Table S4. Parameters for kinetic models of U(VI) adsorption on PAO and K_2FeO_4@PAO at pH 8.2 ± 0.1 and T = 298 ± 1 K.

	Pseudo first order			Pseudo second order		
	k_1 (1/h)	q_e (mg/g)	R^2	k_2 (g/mg·h)	q_e (mg/g)	R^2
PAO	0.697	9.37	0.990	0.0757	10.9	0.999
K_2FeO_4@PAO	0.567	22.4	0.995	0.0230	26.9	0.998

Table S5. Parameters calculated from Langmuir and Freundlich models for U(VI) adsorption on PAO and K_2FeO_4@PAO at pH 8.2 ± 0.1.

	T (K)	Langmuir model			Freundlich model		
		q_{max} (mg/g)	b (L/mg)	R^2	K (mg/g)	1/n	R^2
PAO	298	78.4	0.0188	0.968	6.37	0.444	0.974
	308	87.9	0.0230	0.944	8.98	0.410	0.969
	318	99.3	0.0291	0.919	12.8	0.375	0.961
K_2FeO_4@PAO	298	137	0.0342	0.944	12.8	0.448	0.836
	308	138	0.0599	0.949	20.1	0.379	0.830
	318	142	0.243	0.909	40.8	0.265	0.768

Table S6. Thermodynamic parameters for U(VI) adsorption on PAO and K_2FeO_4@PAO at pH 8.2 ± 0.1.

	T (K)	$\ln K_d$	Thermodynamic parameters		
			ΔG° (KJ/mol)	ΔH° (KJ/mol)	ΔS° (J/mol·K)
PAO	298	7.16	-17.5	28.7	155
	308	7.43	-19.0		
	318	7.89	-20.6		
K_2FeO_4@PAO	298	7.92	-19.5	70.2	301
	308	8.51	-22.5		
	318	9.71	-25.5		

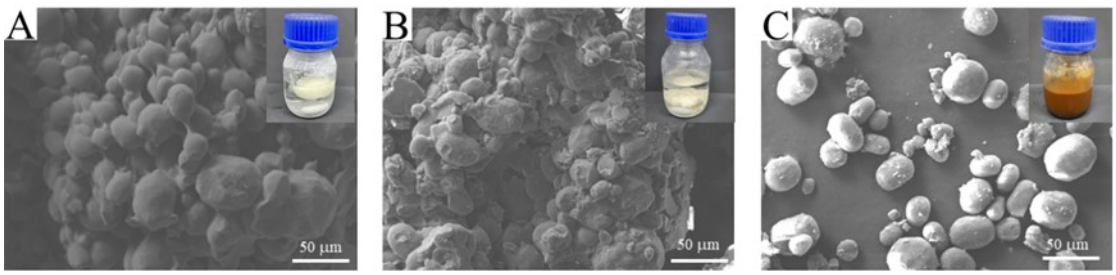


Fig. S1. SEM images of PAO in methanol/water (A), PAO in H_2O (B), K_2FeO_4@PAO in H_2O (C).

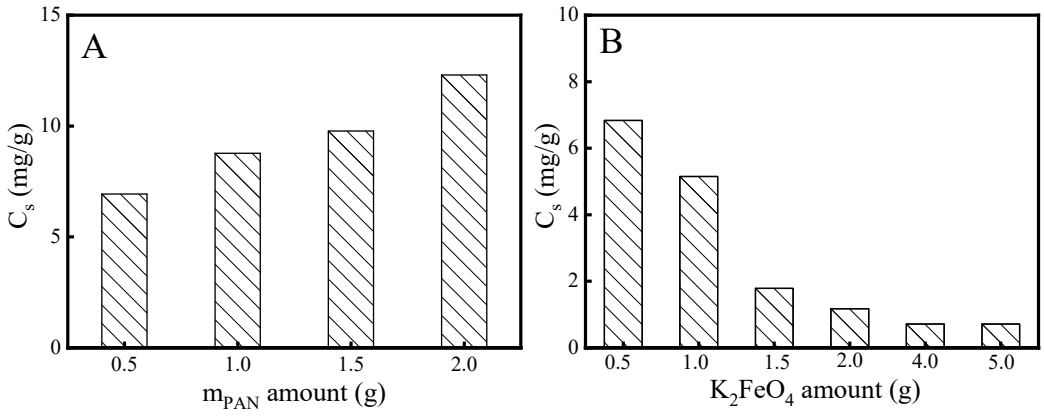


Fig. S2. Effect of used PAN (A) and K_2FeO_4 (B) amounts on the adsorption performance of K_2FeO_4@PAO for U(VI). T = 298 ± 1 K, pH = 8.2 ± 0.1, $C[U(VI)]_{initial}$ = 10.0 mg/L, m/V = 0.4 g/L, I = 0.1 mol/L NaCl, contact time: 24 h.

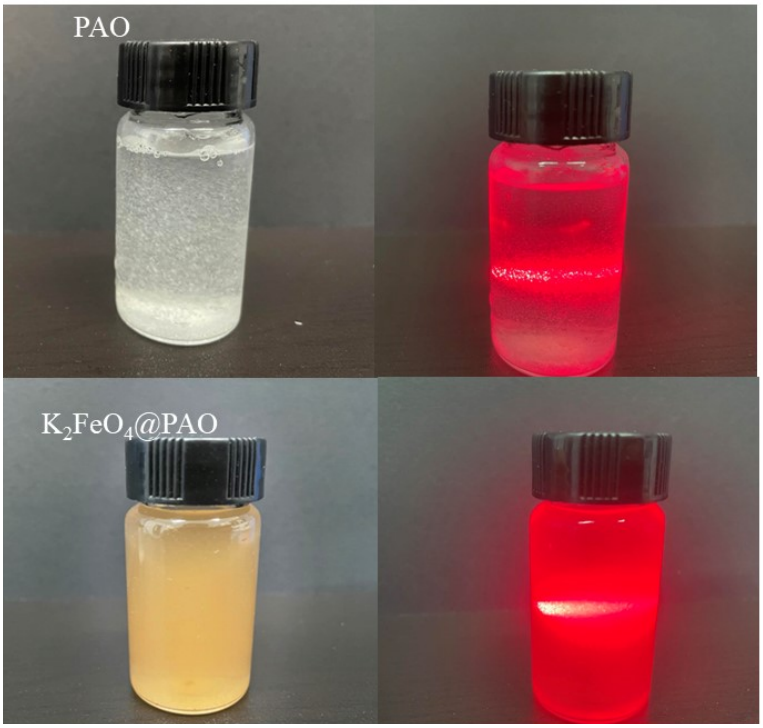
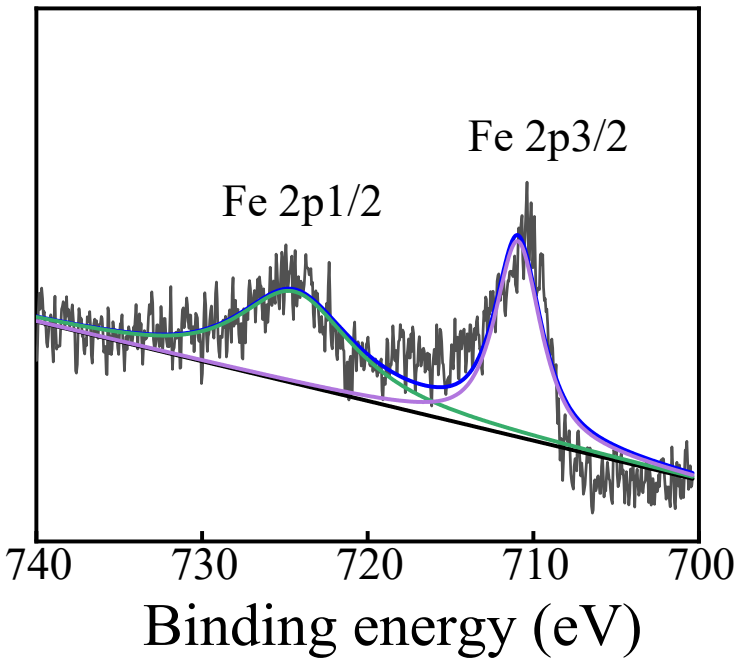


Fig. S3 Comparison of the Tyndall phenomenon of PAO and K_2FeO_4@PAO.



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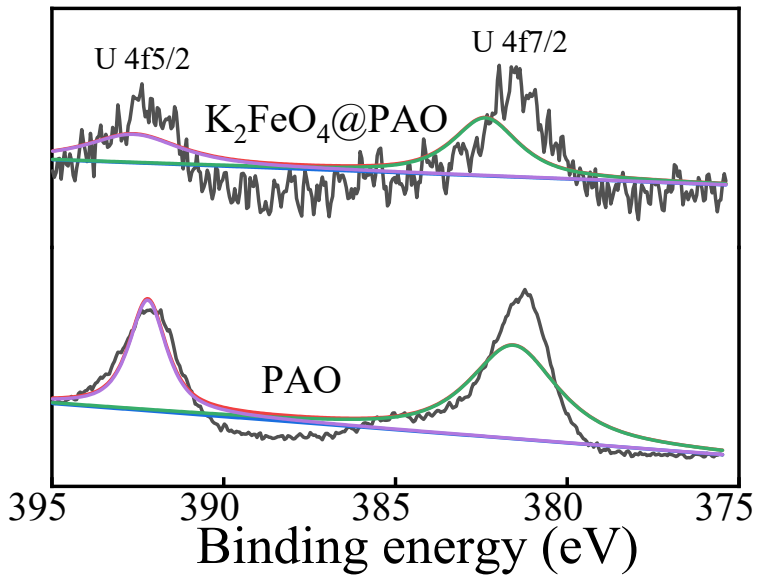
53 **Fig. S4.** XPS Fe 2p of K_2FeO_4@PAO.



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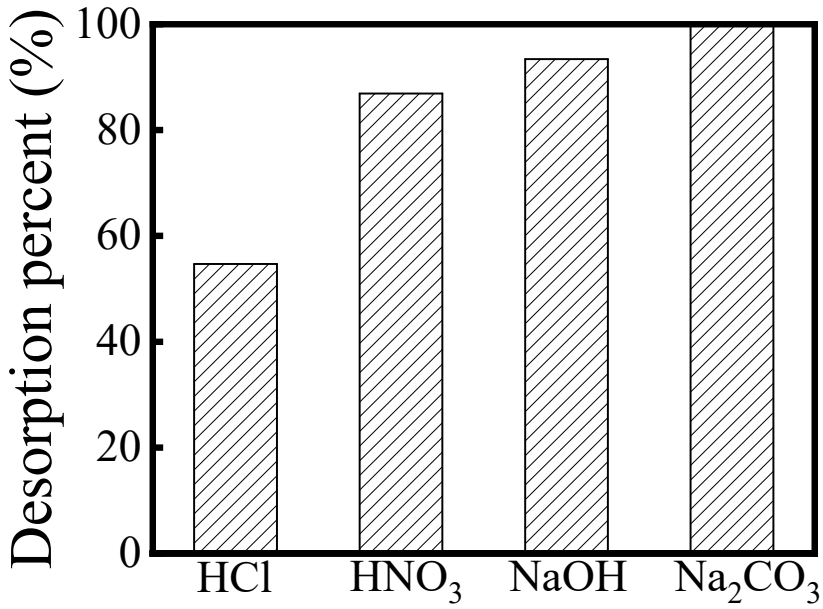
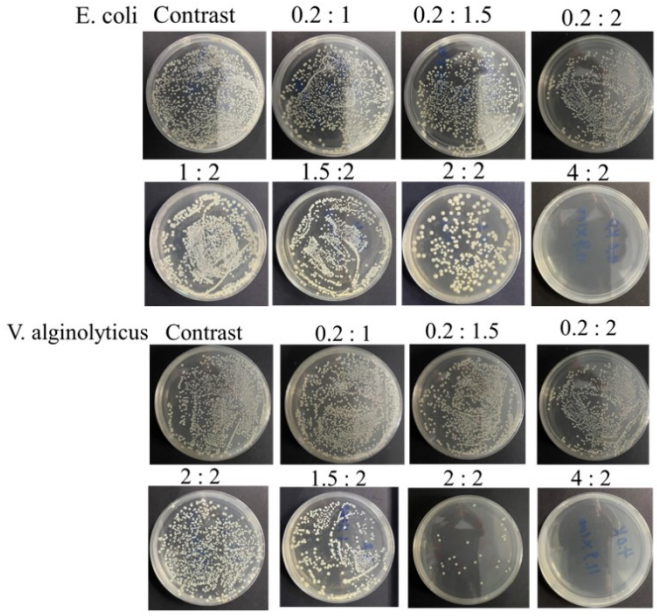
55 **Fig. S5.** XPS U 4f of PAO and K_2FeO_4@PAO.



56

57 **Fig. S6.** Effect of solvents on the desorption of U(VI) from K_2FeO_4@PAO. I = 0.1
58 mol/L NaCl, T = 298 ± 1 K, contact time: 24 h. $C[U(VI)]_{initial}$ = 10.0 mg/L, m/V =
59 0.40 g/L, pH = 8.2 ± 0.1, the concentration of all desorption agents was 0.5 mol/L.



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61 **Fig. S7.** The change colonies of E. coli and V. alginolyticus on agar plates at different
62 conditions. The K_2FeO_4@PAO materials were named according to the used amounts
63 of K_2FeO_4 and PAN (Table 1).