Supplementary Information

Selective Sorption of PAHs from TX100 Solution by Resin SP850: Effects of TX100 Concentrations and PAHs Solubility

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Figure S2 Calculated K_f values ($\log K_{fcal}$) using equation 6 versus experimental K_f values ($\log K_{fexp}$). Solid lines is the reference line, y= x, indicating that the $\log K_{fcal}$ values equal to the $\log K_{fexp}$ values. Dashed lines indicate the SD values from the reference lines.

Figure S3 1/n values of 6 PAHs by SP850 from TX100 solution with their sequence number (Table S1). Solid line is the reference line of average 1/n value (1/n=0.775) of 6 PAHs by SP850 from TX100 solution. Dashed lines indicate the SD value from the reference line.

Figure S4 Correlations between the modified selectivity parameters (S^*) of phenanthrene by SP850 with various doses and TX100 equilibrium concentrations ($C_{e,TX100}$). Solid lines are fitted by the Parabolic equation.

Table S1 Freundlich model fitted isotherm parameters of PAHs by SP850 in the presence of TX100[a]

Sequence number	PAHs	$C_{0,TX100}$ (mg/L)	K_f	1/n	F	P	R^2	N
1	Naphthalene	1500	12.5±0.4	0.849±0.017	7455	＜0.001	0.998	16
2		2000	6.85±0.33	0.823±0.018	5836	＜0.001	0.997	16
3		3000	4.58±0.22	0.846±0.016	7921	＜0.001	0.998	16
4		5000	2.22±0.05	0.874±0.007	49517	＜0.001	0.999	17
5		8000	1.38±0.04	0.883±0.008	42974	＜0.001	0.999	16
6		10000	0.814±0.027	0.853±0.008	32362	＜0.001	0.999	16
7	Acenaphthene	1500	15.5±0.4	0.780±0.014	10170	＜0.001	0.998	14
8		2000	11.0±0.4	0.758±0.014	9311	＜0.001	0.998	14
9		3000	7.41±0.31	0.740±0.015	8049	＜0.001	0.997	14
10		5000	4.34±0.19	0.774±0.014	9789	＜0.001	0.998	15
11		8000	2.41±0.04	0.804±0.005	82914	＜0.001	0.999	14
12		10000	1.80±0.05	0.805±0.008	32740	＜0.001	0.999	14
13	Phennanthrene	1500	32.8±0.5	0.743±0.014	8891	＜0.001	0.998	16
14		2000	17.3±0.2	0.749±0.007	36458	＜0.001	0.999	16
15		3000	9.65±0.36	0.773±0.016	7507	＜0.001	0.997	16
16		5000	4.89±0.09	0.803±0.006	48599	＜0.001	0.999	17
17		8000	2.98±0.11	0.808±0.011	18186	＜0.001	0.999	16
18		10000	2.03±0.07	0.817±0.010	20060	＜0.001	0.999	17
19	Pyrene	1500	24.2±0.3	0.745±0.019	4001	＜0.001	0.996	18
20		2000	13.4±0.2	0.784±0.014	8787	＜0.001	0.998	19
21		3000	9.10±0.32	0.801±0.022	3787	＜0.001	0.995	19
22		5000	6.26±0.20	0.798±0.019	5536	＜0.001	0.996	16
23		8000	2.94±0.11	0.863±0.015	10233	＜0.001	0.998	19
24		10000	2.22±0.14	0.874±0.024	4107	＜0.001	0.996	19

Sequence number	PAHs	$C_{0,TX100}$ (mg/L)	K_f	1/n	F	P	R^2	N
25	Anthracene	1500	34.9±0.6	0.714±0.011	10817	＜0.001	0.998	19
26		2000	24.3±0.2	0.776±0.010	18985	＜0.001	0.999	19
27		3000	13.9±0.1	0.753±0.009	22058	＜0.001	0.999	18
28		4000	9.51±0.08	0.742±0.012	10974	＜0.001	0.998	19
29		5000	7.08±0.07	0.71±0.01	11767	＜0.001	0.998	19
30		8000	5.26±0.06	0.777±0.011	15197	＜0.001	0.999	19
31		10000	3.51±0.05	0.779±0.009	20332	＜0.001	0.999	19
32	Benzanthracene	1500	38.5±0.7	0.701±0.012	9377	＜0.001	0.998	19
33		2000	25.6±0.3	0.699±0.012	9259	＜0.001	0.998	19
34		3000	14.4±0.1	0.742±0.008	27872	＜0.001	0.999	18
35		4000	9.70±0.04	0.695±0.006	43623	＜0.001	0.999	19
36		5000	7.43±0.05	0.702±0.008	24906	＜0.001	0.999	19
37		8000	5.84±0.06	0.715±0.009	18970	＜0.001	0.999	19
38		10000	4.22±0.05	0.685±0.008	19098	＜0.001	0.999	19

[a] All estimated parameter values and their standard errors were determined by a commercial software (SPSS 20.0) with nonlinear regression; N is the number of experimental data.

Table S2 Correlations of PAHs sorption coefficient ($\log K_f$) with TX100 equilibrium concentrations ($\log C_{e,TX100}$)[a]

PAHs	Equations	F	P	R^2	N
Naphthalene	$\log K_f = -0.935(\pm 0.038)\log C_{e,TX100} + 3.75(\pm 0.13)$	608	＜0.001	0.995	5
Acenaphthene	$\log K_f = -0.831(\pm 0.049)\log C_{e,TX100} + 3.60(\pm 0.17)$	291	＜0.001	0.986	6
Phenanthrene	$\log K_f = -1.05(\pm 0.02)\log C_{e,TX100} + 4.49(\pm 0.08)$	1993	＜0.001	0.998	6
Pyrene	$\log K_f = -0.882(\pm 0.063)\log C_{e,TX100} + 3.89(\pm 0.22)$	196	＜0.001	0.980	6
Anthracene	$\log K_f = -0.883(\pm 0.034)\log C_{e,TX100} + 4.08(\pm 0.12)$	658	＜0.001	0.992	7
Benzanthracene	$\log K_f = -0.857(\pm 0.036)\log C_{e,TX100} + 4.02(\pm 0.12)$	575	＜0.001	0.991	7

[a] All estimated parameter values and their standard errors were determined by a commercial software (SPSS 20.0) with linear regression; N is the number of experimental data.

Table S3 Results of linear regressions between logK_f and logS_w of PAHs[a]

$C_{0,TX100}$ (mg/L)	α	β	F	P	R^2	N
1500	-0.136(±0.039)	1.34(±0.05)	12.4	0.024	0.756	6
2000	-0.154(±0.035)	1.12(±0.04)	19.4	0.012	0.829	6
3000	-0.135(±0.024)	0.918(±0.029)	32.0	0.005	0.889	6
5000	-0.143(±0.025)	0.652(±0.030)	33.6	0.004	0.894	6
8000	-0.170(±0.026)	0.436(±0.032)	41.7	0.003	0.912	6
10000	-0.186(±0.028)	0.270(±0.035)	43.6	0.003	0.916	6

[a] All estimated parameter values and standard errors were determined by a commercial software (SPSS 20.0) with linear regression; N is the number of experimental data.

Table S4 Parabolic equation fitted S^* values of PAHs by SP850 from TX100 solution[a]

PAHs	A/(×10^{-8})[b]	B/(×10^{-4})[b]	F	P	R^2	N	B/(-2A)[c]
Naphthalene	-12.6(±1.11)	10.5(±0.89)	70.8	0.00109	0.928	6	4167
Acenaphthene	-7.16(±0.61)	10.2(±0.72)	136	＜0.001	0.862	8	7121
Phenanthrene	-7.03(±0.61)	11.1(±0.7)	205	＜0.001	0.695	8	7895
Pyrene	-4.88(±0.56)	9.79(±0.89)	79.0	＜0.001	0.757	8	10021
Anthracene	-2.77(±0.19)	9.85(±0.56)	201	＜0.001	0.877	11	17772
Benzanthracene	-2.65(±0.19)	10.3(±0.5)	290	＜0.001	0.905	11	19457

[a] All estimated parameter values and standard errors were determined by a commercial software (SPSS 20.0) with nonlinear regression; N is the number of experimental data;

[b] A and B are the coefficients of the quadratic and primary terms of the parabolic equation, respectively;

[c] $C_{e,TX100}$ = -B/(2A) are the optimal TX100 concentrations ($C_{opTX100}$) in soil washing solution.

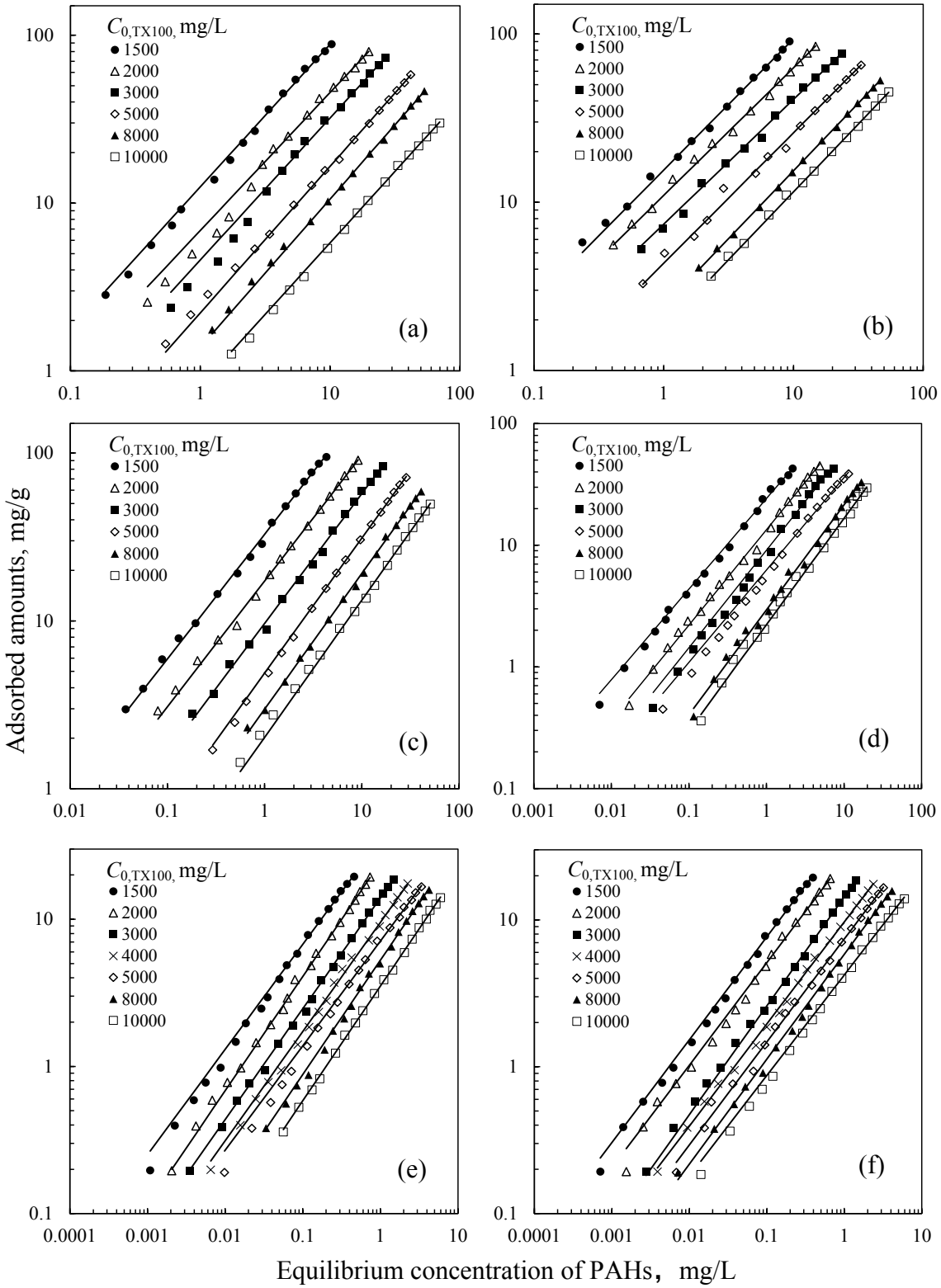
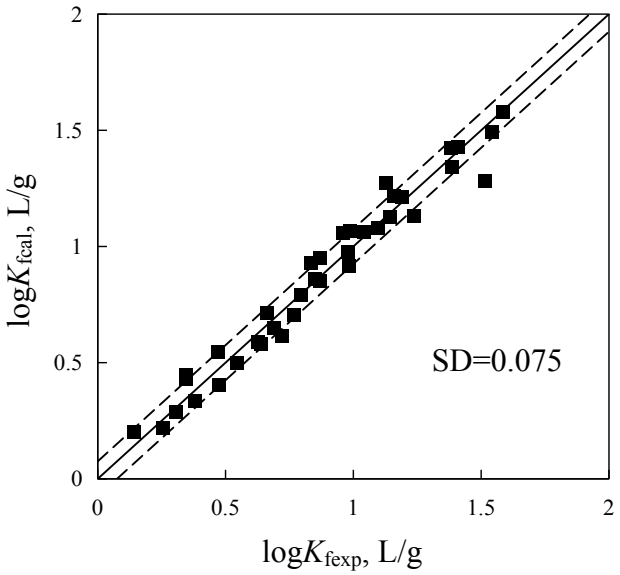


Figure S1 Freundlich model (solid lines) fitted isotherms of naphthalene (a), acenaphthene (b), phenanthrene (c), pyrene (d), anthracene (e) and benzanthracene (f) by SP850 at given TX100 initial concentrations ($C_{0,TX100}$).



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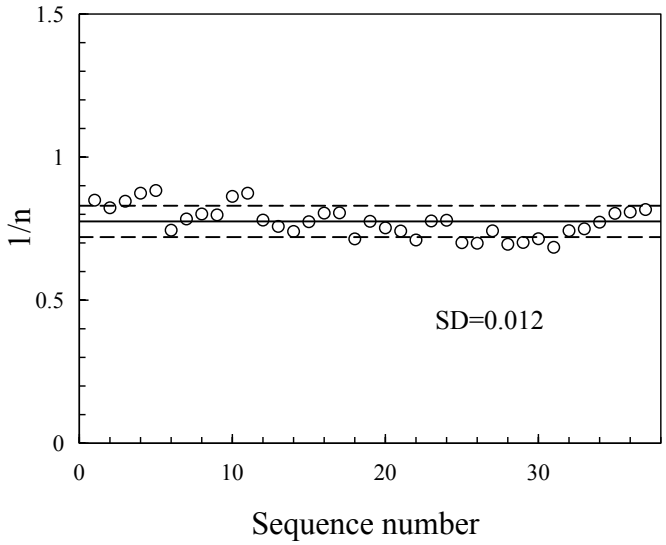

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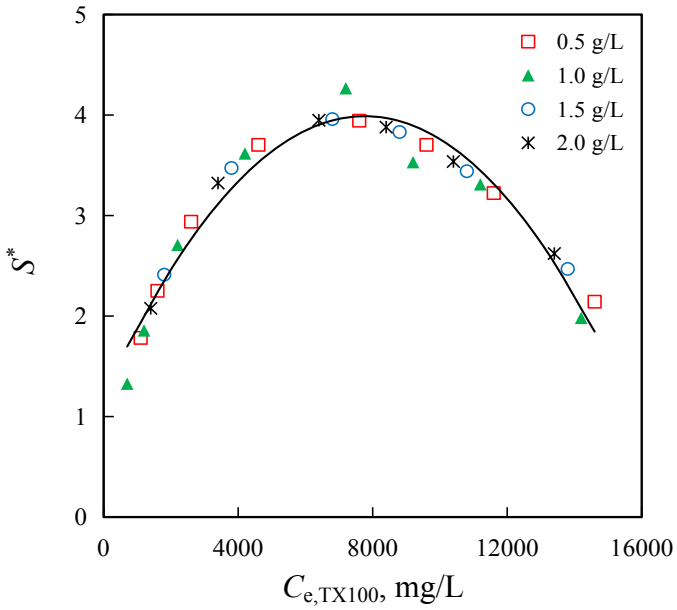

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