Supporting information for

Single and Bicomponent Anionic Dyes Adsorption Equilibrium Studies on Magnolia-Leaf-Based Porous Carbons

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Table S.I.1 Different isotherm models used in this study and their linear forms

Isotherm	Nonlinear form	Linear form	Plot	Eqs.
Langmuir-I	$q_e = \frac{K_L C_e}{1+K_L C_e}$	$\frac{C_e}{q_e} = \frac{1}{q_L \cdot K_L} + (\frac{1}{q_L}) \cdot C_e$	$\frac{C_e}{q_e}$ versus C_e	(4)
Freundlich	$q_e = K_f C_e^{\frac{1}{n}}$	$\ln q_e = \ln K_f + (\frac{1}{n}) \cdot \ln C_e$	$\ln q_e$ versus $\ln C_e$	(5)
Temkin	$q_e = ((RT/b)\ln(A \cdot C_e))$	$q_e = \beta \ln K_T + \beta \ln C_e$	q_e versus $\ln C_e$	(6)
D–R	$q_e = q_s e^{(-K_D \varepsilon^2)}$	$\ln q_e = \ln q_s - K_D \varepsilon^2$	$\ln q_e$ versus ε^2	(7)

Where q_m is the maximum capacity of adsorption in mg/g; K_L is a constant related to the affinity of the binding sites in L/mg; 'K_f' and 'n' are the measures of adsorption capacity and intensity of adsorption; $\beta = (RT)/b_T$, is the Temkin constant; T is the absolute temperature in K; R is the universal gas constant; b_T is related to the heat of adsorption in kJ/mol.; K_T is the equilibrium binding constant in L/mol.; q_s is the D-R isotherm constant in mg/g; ε represents the Polanyi potential constant in kJ mol^{-1}; $\varepsilon = RT\ln(1+\frac{1}{C_e})$

Table S.I.2 Parameters of the isotherm models for the adsorption processes

Isotherm		SDS				BDS			
		OII		MO		OII		MO	
Model	Parameter	Value	R^2	Value	R^2	Value	R^2	Value	R^2
Langmuir	q_L (mg/g)	1501	0.9996	870	0.9999	962	0.9998	448	0.9999
	K_L (L/g)	0.25		0.50		0.29		0.49	
Freundlich	k_f(L/g)	990	0.9855	647	0.8789	496	0.9417	369	0.9178
	n	13.84		19.12		8.15		29.47	
Temkin	b_T (kJ/mol)	28.02	0.9892	60.51	0.8857	30.88	0.9425	180	0.9293
	K_T (L/g)	6.6×10^4		5.7×10^6		582		4.4×10^{11}	
D–R	q_s (mg/g)	1393	0.7117	861	0.9609	827	0.5366	441	0.9232
	K_D (mol^2/kJ^2)	1.0×10^{-7}		1.9×10^{-6}		2.4×10^{-8}		8.7×10^{-8}	

Table S.I.3 Isotherm parameters of OII and MO adsorption from binary solutions

Sample	Dye	Competitive-Langmuir isotherm					Langmuir		
		q_{max1} (mg/L)	K_{L1} (L/mg)	q_{max2} (mg/L)	K_{L2} (L/mg)	R^2	q_L (mg/g)	K_L (L/mg)	R^2
MPC-1	OII	1000	56.34	–	–	0.815	962	0.29	0.9998
	MO	–	–	500	2.00	0.982	448	0.49	0.9999

Table S.I.4 Comparative assessment of uptake capacity of OII and MO onto some adsorbents from partial previously literatures

Dyestuff	Adsorbent	Maximum monolayer uptake capacities (mg/g)	Reference	System
OII	MCP-1	1488	this work	SDS
	MCP-1	951	this work	BDS
	ML	128	this work	SDS
	ML	79	this work	BDS
	CS-A.C.	322	this work	SDS
	CS-A.C.	286	this work	BDS
	NCTW	312	21	SDS
	ACX	499	40	SDS
	ACF	438	4	SDS
MO	MCP-1	869	this work	SDS
	MCP-1	447	this work	BDS
	ML	115	this work	SDS
	ML	72	this work	BDS
	CS-A.C.	315	this work	SDS
	CS-A.C.	280	this work	BDS
	FAC	935	19	SDS
	NPAC	161	41	SDS
	MPW	286	42	BDS

Table S.I.5 Kinetic parameters for OII and MO adsorption from SDS and BDS

		Pseudo-first-order rate equation						Pseudo-second-order rate equation					Intra-particle diffusion model		
System	Dye	$q_{e,exp}$ (mg/g)	$q_{e,cal}$ (mg/g)	K_1 (1/min)	R^2	△q (mg/g)	△q (%)	$q_{e,cal}$ (mg/g)	K_2 (g/mg·min)	R^2	△q (mg/g)	△q (%)	C (mg/g)	K_3 (mg/g·min$^{1/2}$)	R^2
SDS	OII	1450	1082	0.2739	0.9536	368	25.38	1512	0.8412	0.9991	-61.8	-4.26	704	159	0.8206
	MO	827	227	0.1449	0.9386	600	72.55	840	1.7838	0.9998	-12.9	-1.56	546	61	0.6667
TDS	OII	757	475	0.1869	0.9250	282	37.24	807	0.5487	0.9992	-49.9	-6.59	391	78	0.7410
	MO	479	52	0.1805	0.7305	427	89.15	488	2.0677	0.9988	-9.2	-1.92	368	25	0.3118