materials

MDPI

Supplementary Materials

Effect of Air Oxidation on Texture, Surface Properties, and Dye Adsorption of Wood-Derived Porous Carbon Materials

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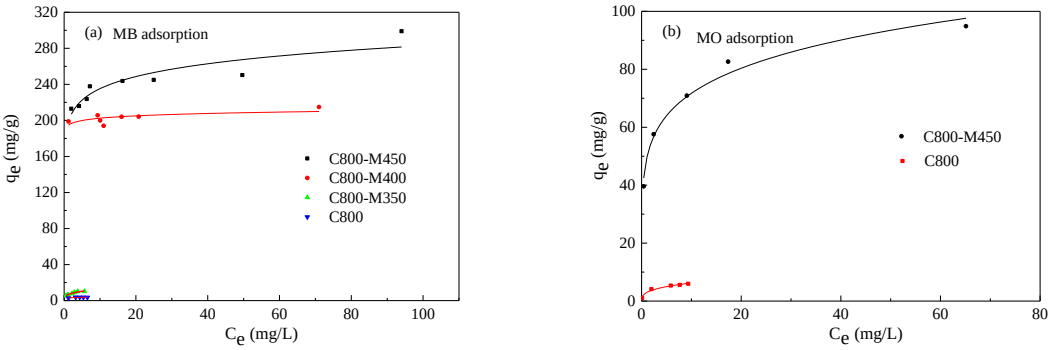
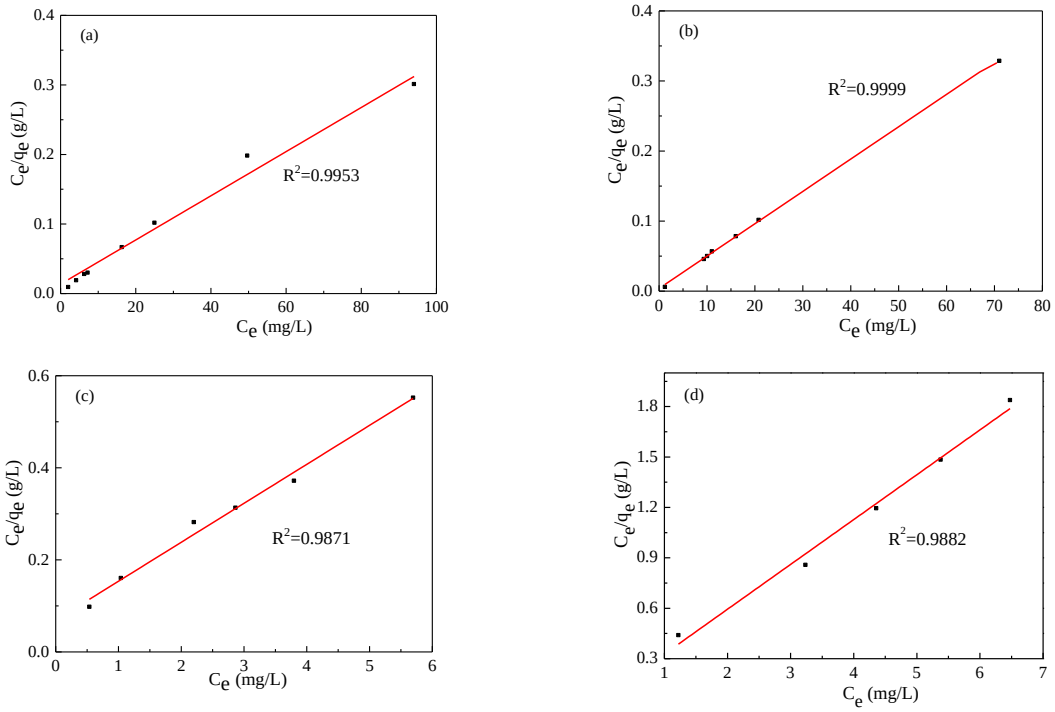


Figure S1. q_e vs C_e plots of as-prepared carbons: (a) MB and (b) MO.



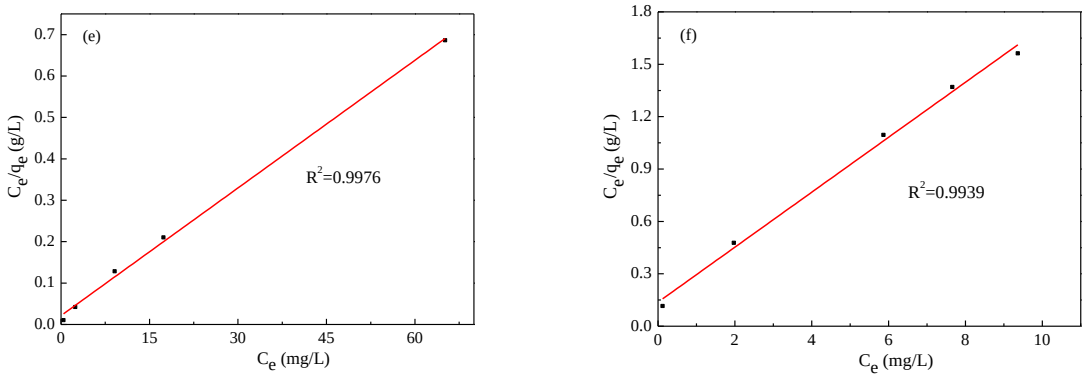


Figure S2. Isothermal adsorption of (a) C800-M450−MB, (b) C800-M400−MB, (c) C800-M350−MB, (d) C800−MB, (e) C800-M450−MO, (f) C800−MO, fitted with the Langmuir model.

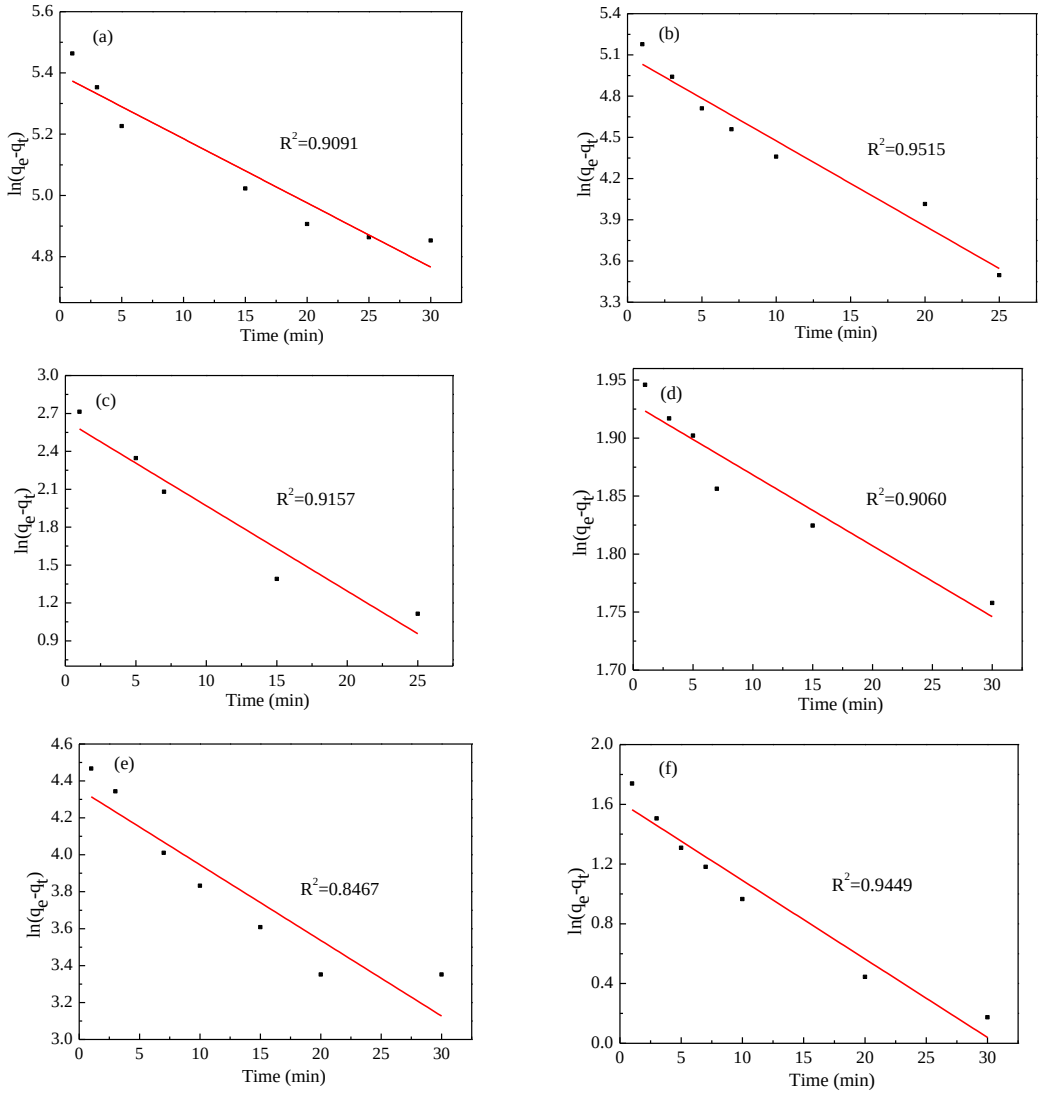


Figure S3. Translated kinetic adsorption $\ln(q_e-q_t)$ vs t plots of (a) C800-M450−MB, (b) C800-M400−MB, (c) C800-M350−MB, (d) C800−MB, (e) C800-M450−MO, (f) C800−MO, fitted with pseudo-first-order model.

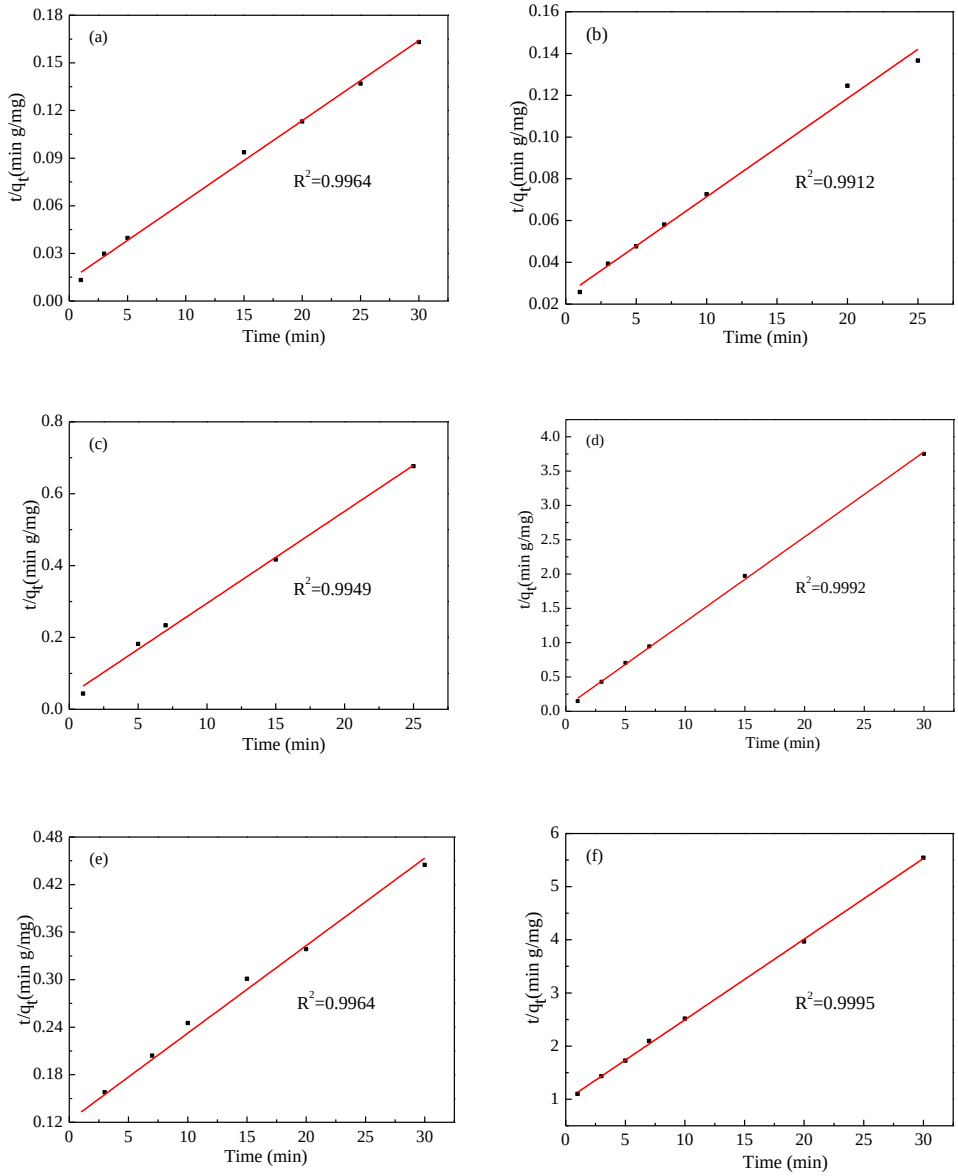


Figure S4. Translated kinetic adsorption t/q_t vs t plots of (a) C800-M450−MB, (b) C800-M400−MB, (c) C800-M350−MB, (d) C800−MB, (e) C800-M450−MO, (f) C800−MO, fitted with pseudo-second-order model.

Table S1. Lists of adsorption isotherm models.

Isotherm	Linear form	Plot
Freundlich	$\ln q_e = \ln K_F + \frac{1}{n} \ln C_e$	$\ln q_e$ vs $\ln C_e$
Dubinin-Radushkevich	$\ln q_e = \ln q_m - k_d \varepsilon^2$	$\ln q_e$ vs ε^2

Table S2. Parameters of the Freundlich and Dubinine-Radushkevich models for adsorption of MB/MO on the carbons.

Samples	Dye	Freundlich			Dubinin-Radushkevich		
		K_F ((mg/g) (mg/L)^n)	1/n	R^2	k_d (mol^2/kJ^2)	q_m (mg/g)	R^2
C800	MB	2.81	0.1603	0.9672	2.00E-07	4.48	0.3477
C800-M350	MB	6.51	0.288	0.9959	1.00E-07	12.89	0.3573
C800-M400	MB	196.37	0.0154	0.8457	8.00E-07	209.94	0.3868
C800-M450	MB	204.94	0.0555	0.8793	1.00E-07	239.87	0.6075
C800	MO	2.61	0.4033	0.9783	5.00E-08	5.32	0.9734
C800-M450	MO	47.80	0.1757	0.9860	7.00E-08	76.72	0.7622

Table S3. Comparison of adsorption performance of various carbon-based adsorbent materials.

Raw materials	Dye	Surface area of carbon (m^2/g)	q_e (mg/g)	reference
Cork	MB MO	580	312 96	This work
Camellia oleifera seed shell	MB	1882	493	37
Banana peel	MO	24	21	[1]
Orange peel	MO	24	21	
Poplar catkins	MO	351	154	[2]
Rattan	MB	1135	359	[3]
Cotton stalk	MB	795	194	[4]
Sunflower stalk	MB	1.2	205	[5]
Tomato processing waste	MB	1093	400	25

References

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