Electronic Supplementary Material (ESI) for New Journal of Chemistry.

Supplementary

Amino Functionalized Magnetic Porous Organic Polymer for Selective Removal of Toxic Cationic Dyes from Textile Wastewater

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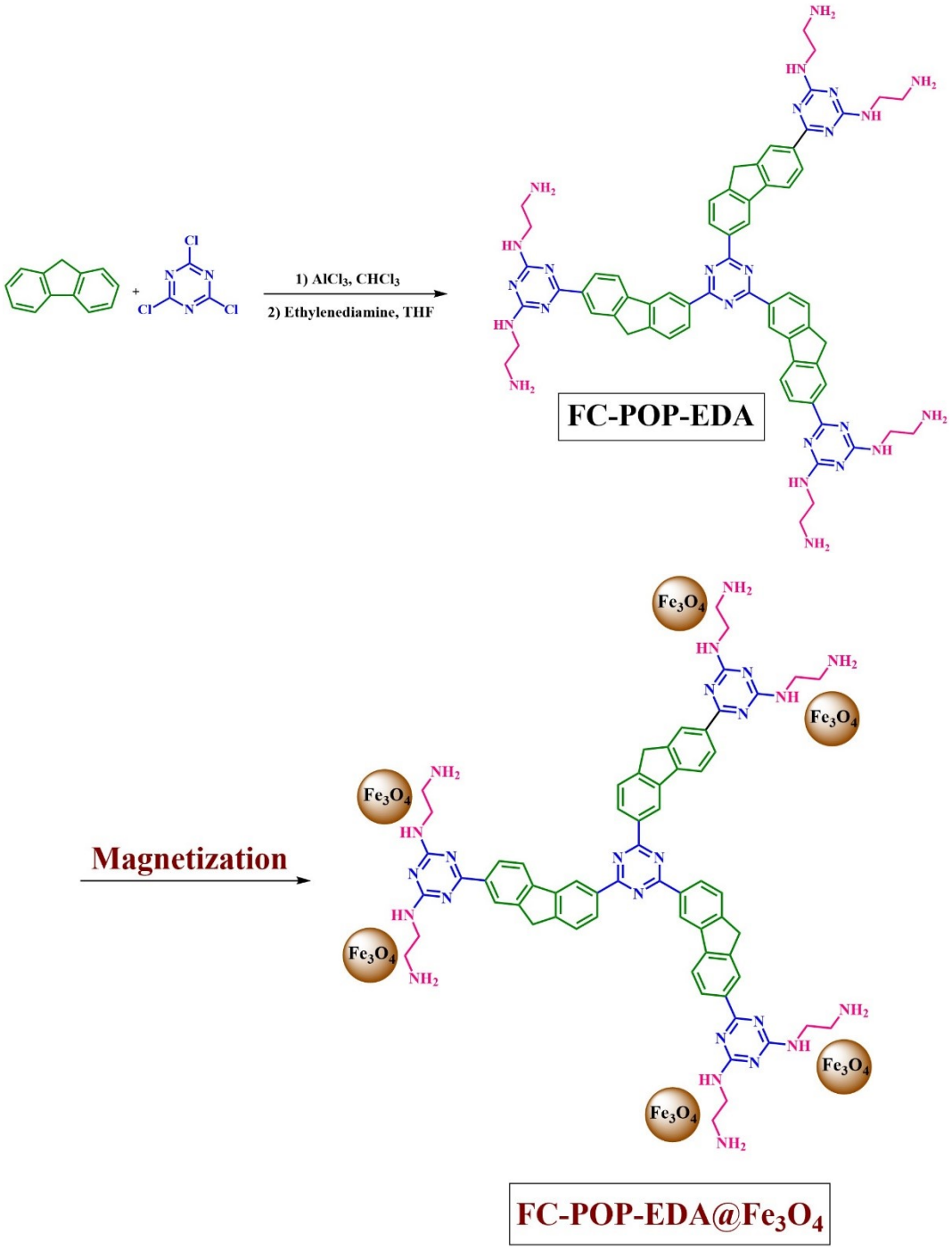


Figure 1s. Synthetic scheme of POP modification with EDA and Fe_3O_4.

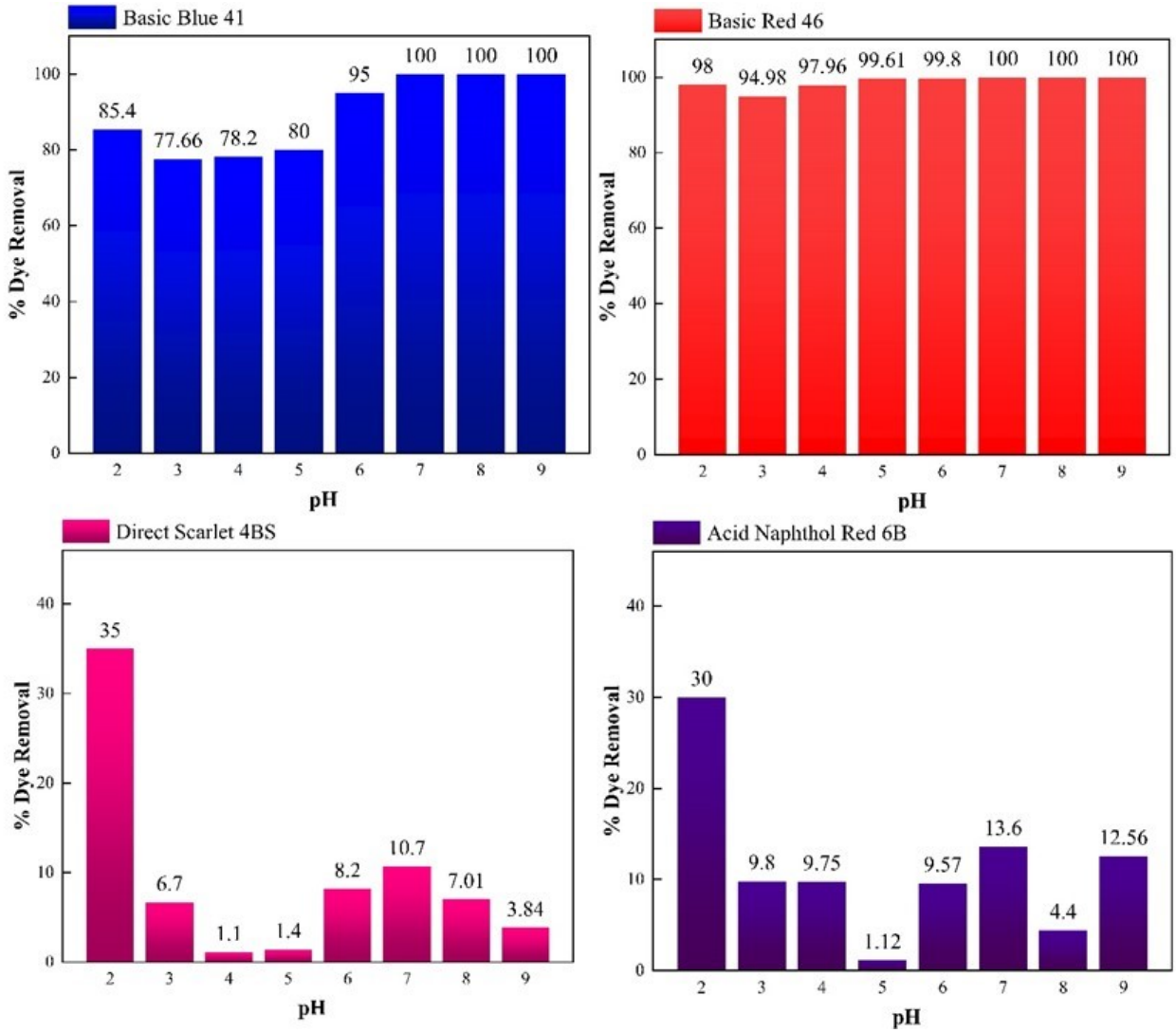


Figure 2s. The effect of pH on the removal efficiency of dyes.

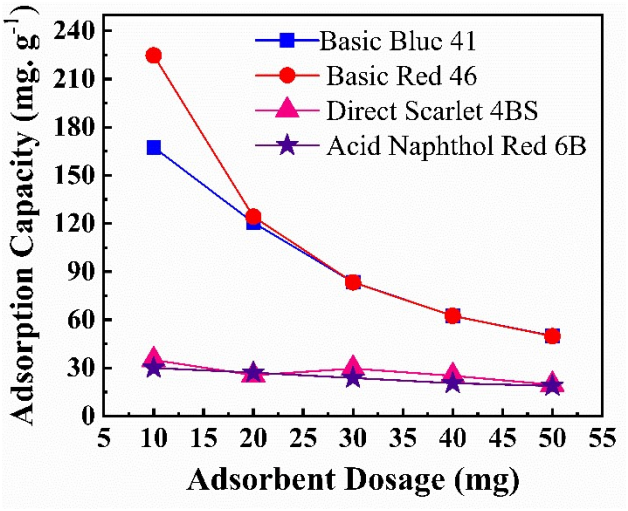


Figure 3s. Effect of adsorbent dosage on the adsorption capacity.

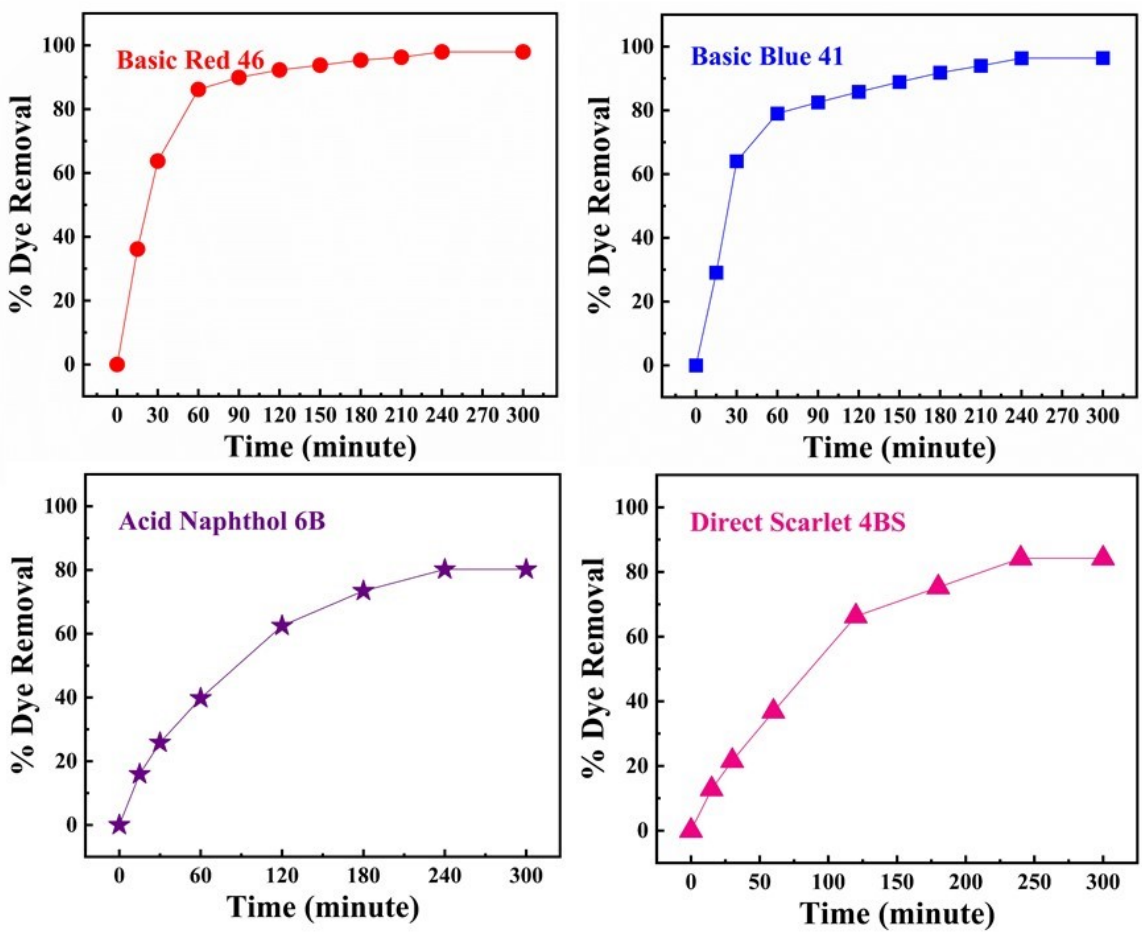
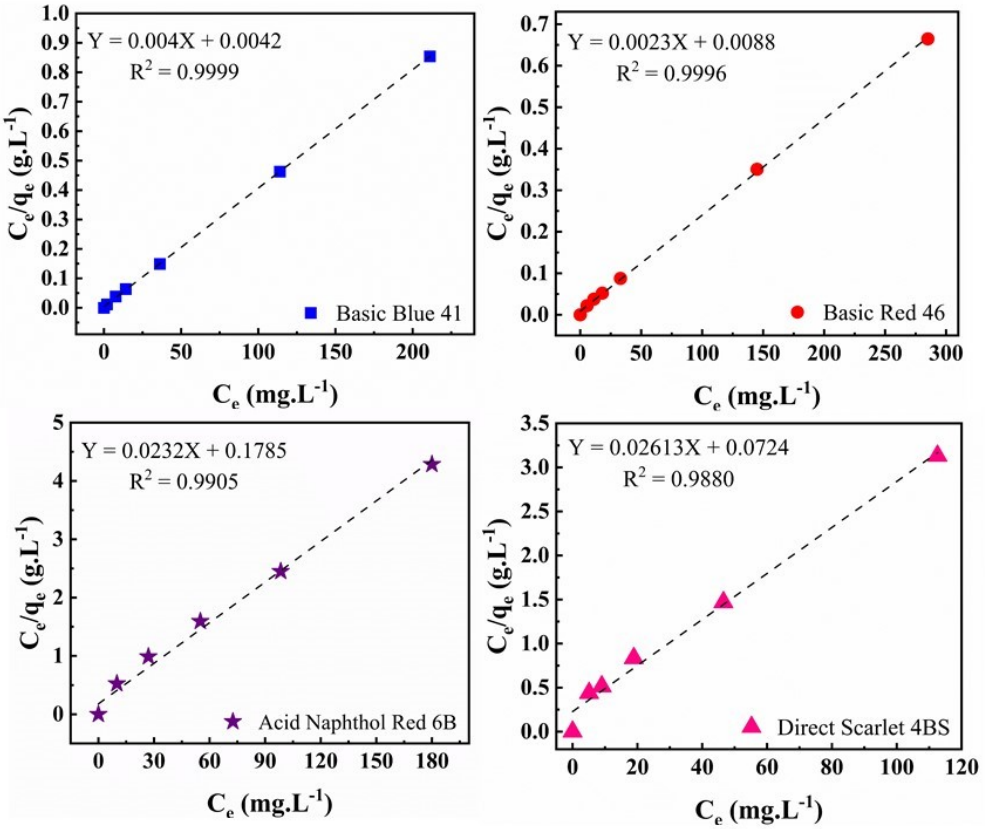
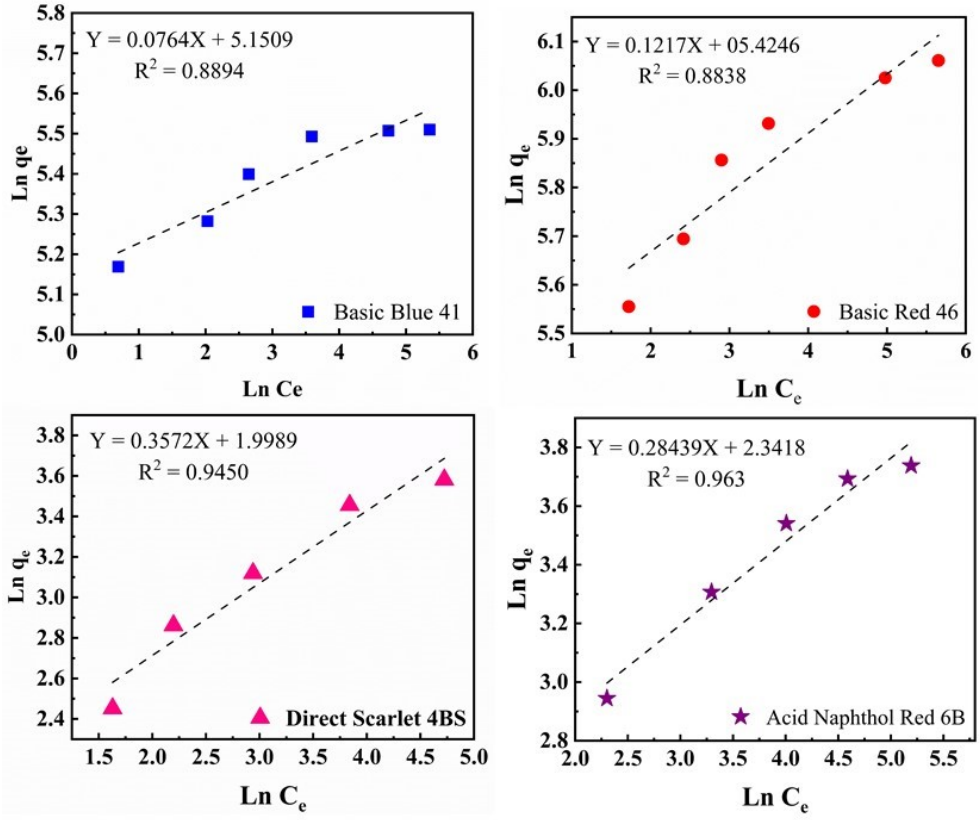


Figure 4s. Adsorption percentage of dyes versus contact time.

(a) Langmuir



(b) Freundlich



(c) Tempkin

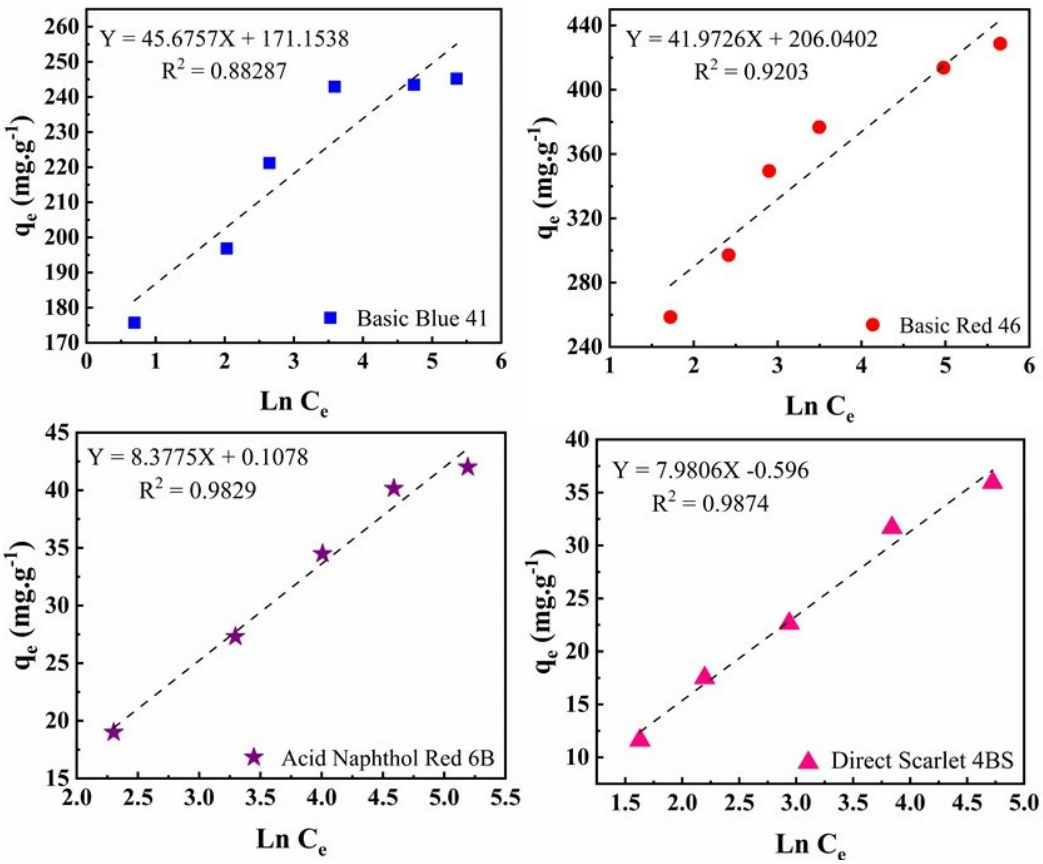
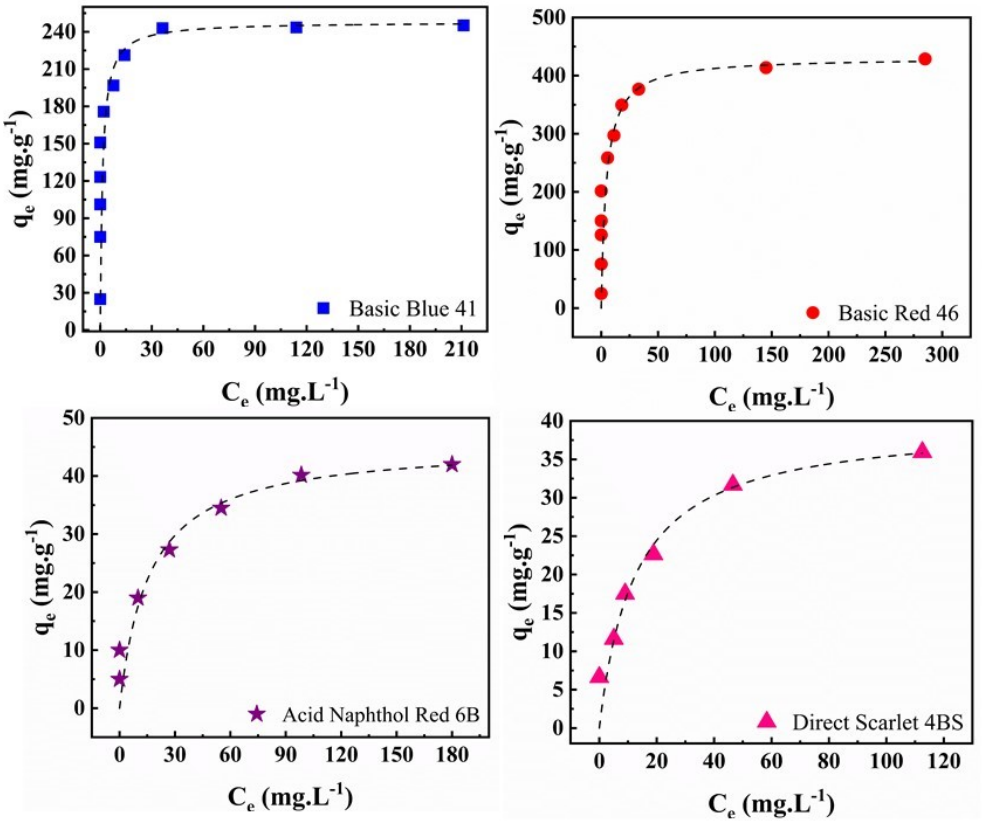


Figure 5, (a) Langmuir, (b) Freundlich and (c) Tempkin linear isotherms of cationic and anionic dyes on FC-POP-EDA@Fe_3O_4.

(a) Langmuir



(a) Freundlich

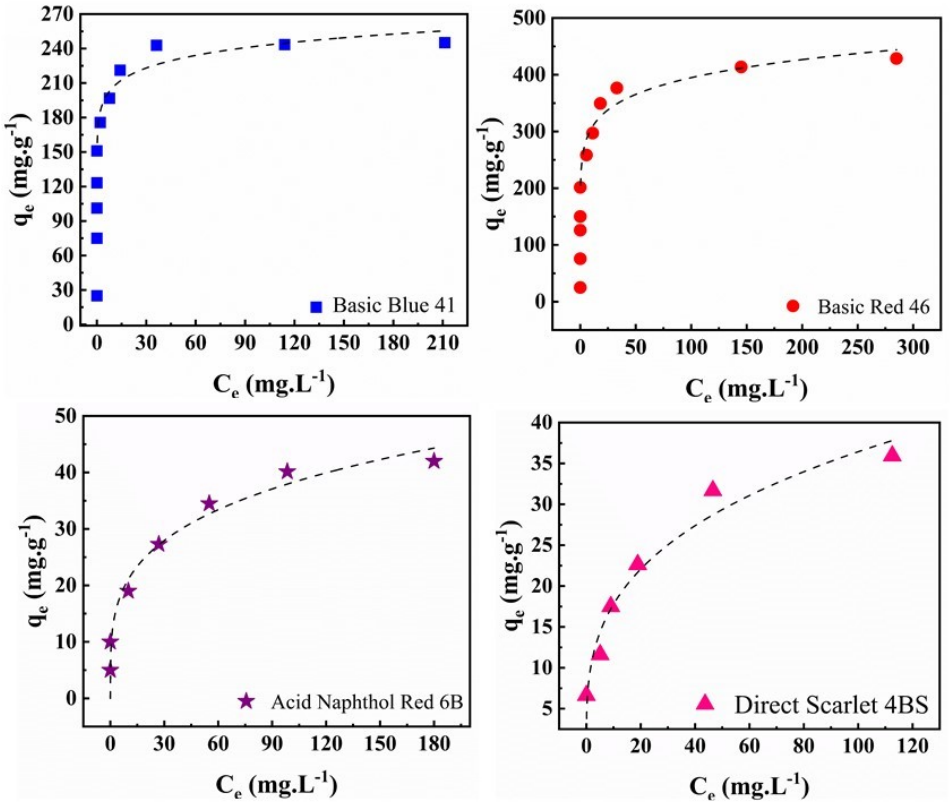


Figure 6, Langmuir and Freundlich nonlinear isotherms of cationic and anionic dyes on FC-POP-EDA@Fe_3O_4.

Table S1. Kinetic parameters FC-POP-EDA@Fe_3O_4

Model	Pseudo-first-order			Pseudo-second-order		
Parameter	q_e	$\mathbf{K_1}$	$\mathbf{R^2}$	q_e	$\mathbf{K_2}$	$\mathbf{R^2}$
Basic blue 41	232.80	0.030	0.9824	262.70	0.0015	0.9816
Basic red 46	372.5	0.034	0.9965	414.24	0.0013	0.9857
Direct scarlet 4BS	34.83	0.009	0.9957	47.83	0.0016	0.9914
Acid naphthol red 6B	41.46	0.011	0.9975	54.21	0.009	0.9963

Pseudo-first-order kinetic model equation: [1]

$$\ln (q_e - q_t) = \ln q_e - K_1 t$$

Pseudo-second-order kinetic models equation:

$$\frac{t}{q_t} = \frac{1}{K_2 q_e^2} + \frac{t}{q_e}$$

$q_e\ (mg/g)$= the amount of dyes adsorbed on FC-POP-EDA@Fe_3O_4 at equilibrium.

$q_t\ (mg/g)$= the amount of dyes adsorbed on FC-POP-EDA@Fe_3O_4 at time t.

t = time adsorption

K_1 = The equilibrium rate constant of the pseudo-first-order adsorption process (1/minute)

K_2 = The equilibrium rate constant of the pseudo-second-order adsorption process (1/minute)

Table S2. Resulting linear adsorption isotherm parameters

Model	*Langmuir*			*Freundlich*			*Temkin*		
Parameter	q_{max}	K_L	R^2	K_F	n	R^2	K_T	b_T	R^2
Basic blue 41	250	0.95	0.9999	172.58	13.08	0.8894	42.39	54.249	0.8828
Basic red 46	434.78	0.26	0.9996	225.87	8.22	0.8838	134.28	59.028	0.9203
Direct scarlet 4BS	38.31	0.36	0.9880	7.38	2.79	0.9405	0.93	310.44	0.9875
Acid naphthol red 6B	43.10	0.13	0.9905	10.39	3.51	0.963	1.01	295.74	0.9829

q_{max}(mg/g), K_L= L/mg, KT= L/g

Model	*Langmuir*	*Freundlich*	*Temkin*
Linear equation	$\frac{C_e}{q_e} = \frac{1}{K_L q_{max}} + \frac{C_e}{q_{max}}$	$\ln q_e = lnK_F + \frac{1}{n} lnC_e$	$q_e = \frac{RT}{b_t} \ln A_t + \left(\frac{RT}{b_t}\right) \ln C_e$
Nonlinear equation	$q_e = \frac{q_m K_L C_e}{1 + K_L C_e}$	$q_e = K_F C_e^{1/n}$	$q_e = \frac{RT}{b_t} \ln A_t C_e$

[2]

References

[1] J. Zhao, L. Xu, Y. Su, H. Yu, H. Liu, S. Qian, W. Zheng, Y. Zhao, Zr-MOFs loaded on polyurethane foam by spolydopamine for enhanced dye adsorption, Journal of Environmental Sciences, 101 (2021) 177-188.

[2] K. Foo, B. Hameed, insight into the modeling of adsorption isotherm systems, Chemical Engineering Journal, 156 (2010) 2-10.