

Electronic Supplementary Information (ESI)

Controlled synthesis of porous nano/micro-sized metal-organic frameworks with superior capacity and selectivity for dye adsorption from aqueous solution

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Table S1. Characteristic parameters of the adsorption of MB by NMOF **1** samples.

	Model	Parameters	NMOF 1a	NMOF 1b
Adsorption kinetics	Pseudo-first-order	$q_{e,Exp}$ (mg g ⁻¹)	118.7	159.5
		$q_{e,Cal}$ (mg g ⁻¹)	51.2	5.3
		k_1 (min ⁻¹)	0.028	0.103
		R^2	0.967	0.823
	Pseudo-second-order	$q_{e,Exp}$ (mg g ⁻¹)	118.7	159.5
		$q_{e,Cal}$ (mg g ⁻¹)	99.5	159.7
k_2 (g mg ⁻¹ min ⁻¹)		6.48×10 ⁻³	0.0632	
	R^2	0.995	1	
Adsorption isotherms	Temkin	A (L g ⁻¹)	16.43	7323.3
		B	77.82	50.73
		R^2	0.980	0.931
	Freundlich	N	6.05	10.9
		k_f (mg g ⁻¹ (L mg ⁻¹) ^{1/n})	261.3	443.0
		R^2	0.958	0.922
	Langmuir	$q_{m,Exp}$ (mg g ⁻¹)	652	738
		$q_{m,Cal}$ (mg g ⁻¹)	685	730
		b (L mg ⁻¹)	0.087	0.749
		R^2	0.995	0.998
ΔG (kJ mol ⁻¹)		-25.4	-30.7	

Table S2. Adsorption capacities for MB by different porous materials.

Material	Adsorption Capacity (mg g ⁻¹)	Ref.
NMOF 1b	738	This work
MIL-235	252	37
MIL-101	195	36
UiO-66-P	91.1	26
PZS nanotubes	69.2	38
FMAAs	40	39
HKUST-1	15.3	40

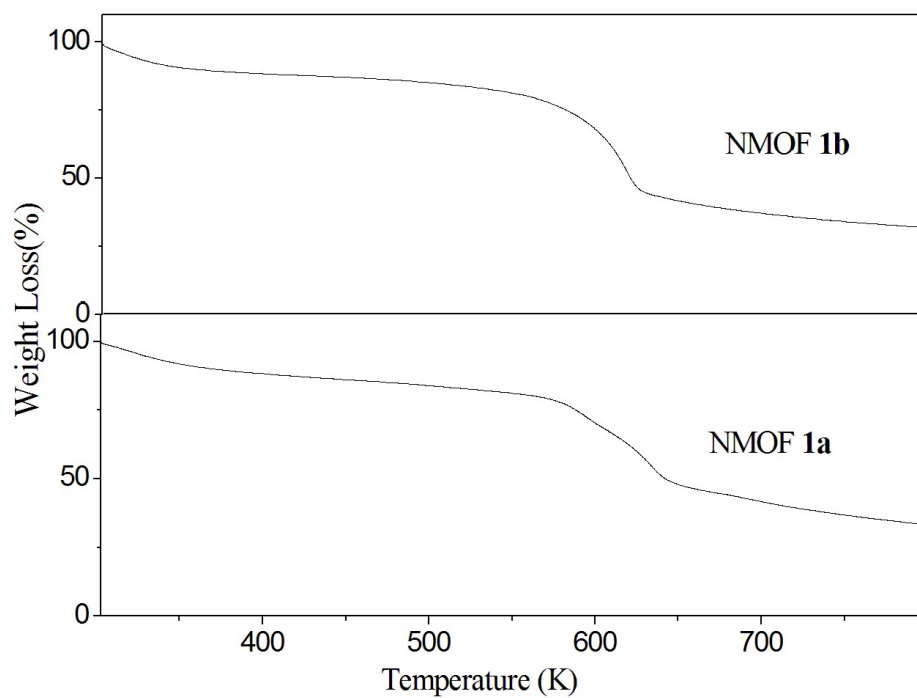


Fig. S1. TG curves of NMOF **1a** and NMOF **1b**.

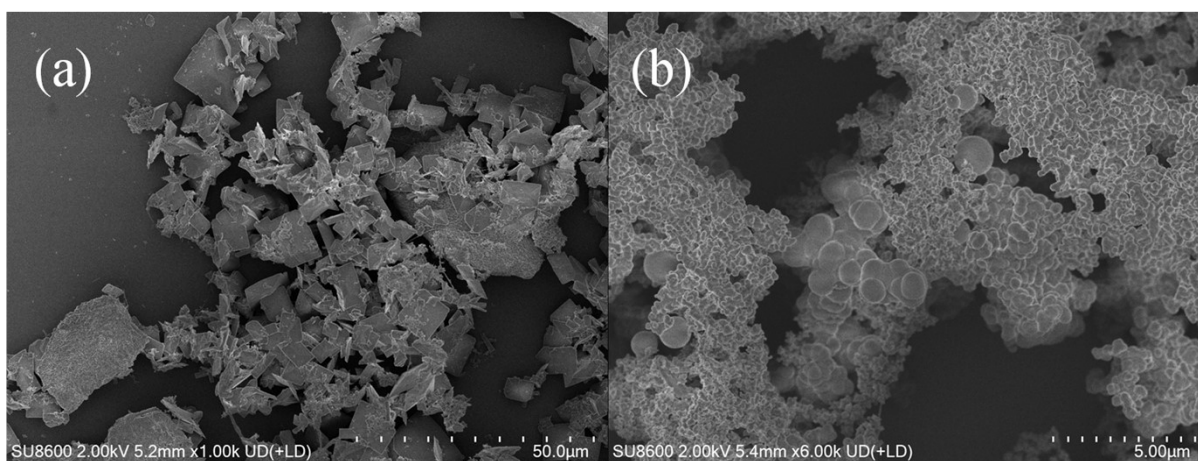


Fig. S2. SEM images of NMOF **1a** (a) and NMOF **1b** (b) when the volume ratio decreases to 14:6.

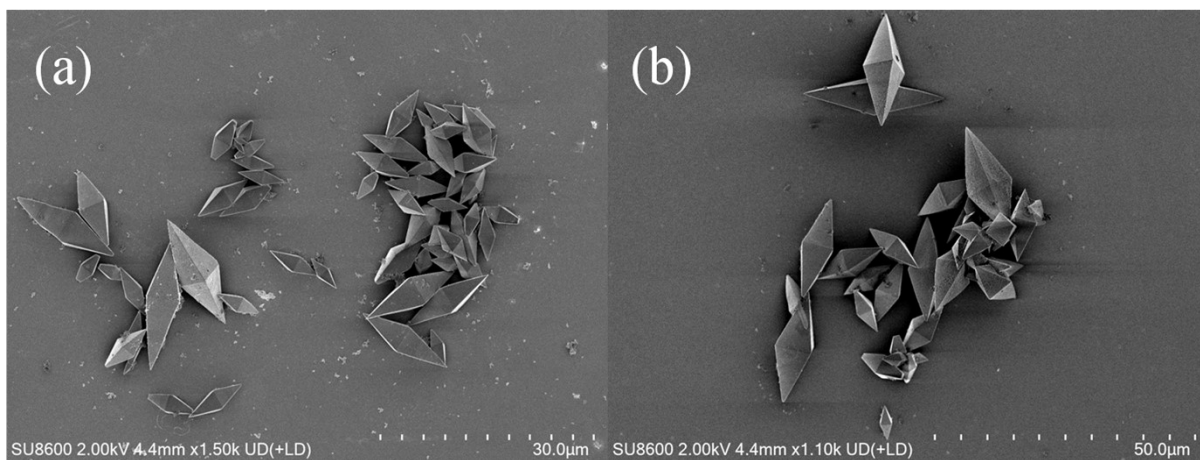


Fig. S3. SEM images of NMOF **1b** synthesized with 0.5 mL aqueous ammonia (a) and 1.0 mL aqueous ammonia.

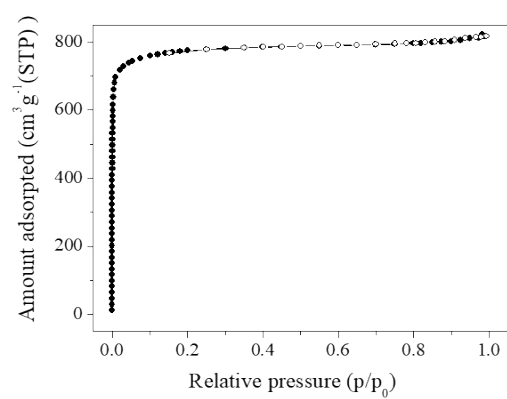


Fig. S4 Adsorption and desorption isotherms of N₂ at 77 K for NMOF **1b** synthesized from the different baths.

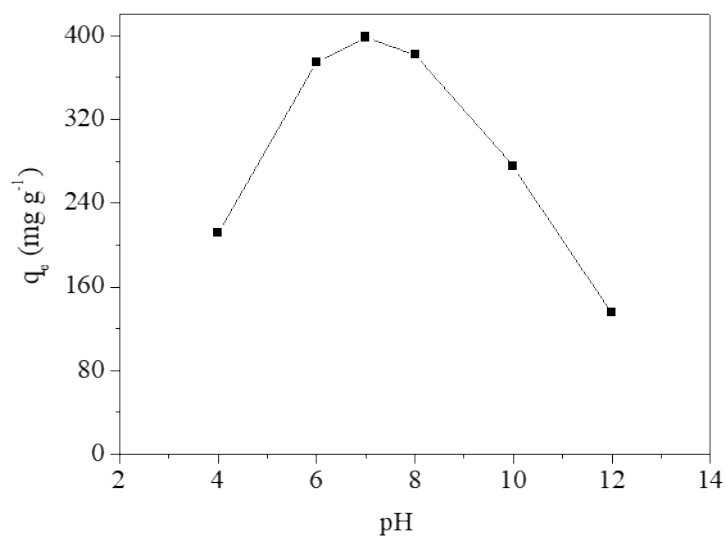


Fig. S5. Effect of pH on MB adsorption on the NMOF1b microcrystals.

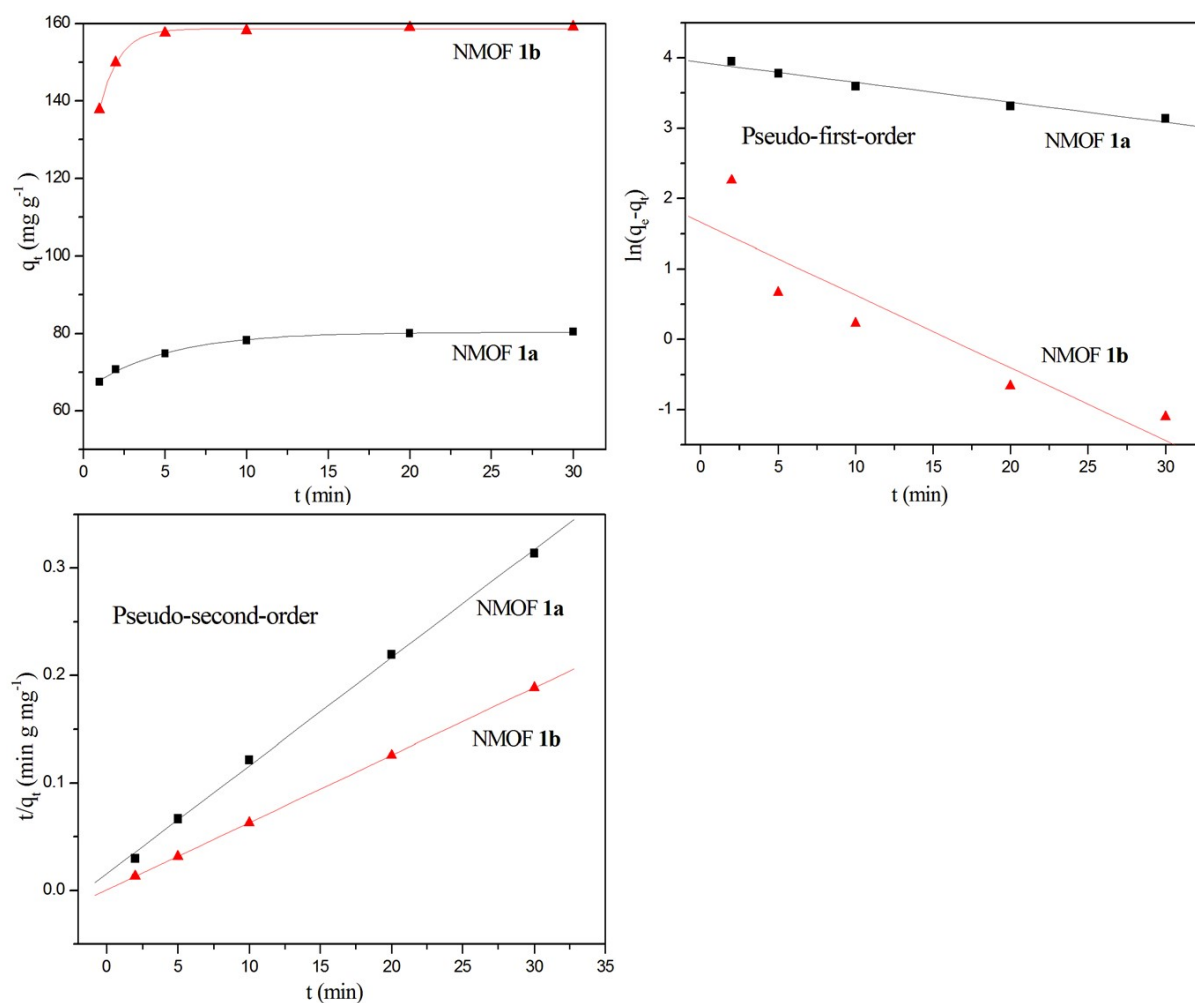


Fig. S6. The adsorption kinetic curves for NMOF **1a** and NMOF **1b** as a function of time, and pseudo-first-order and pseudo-second-order model.

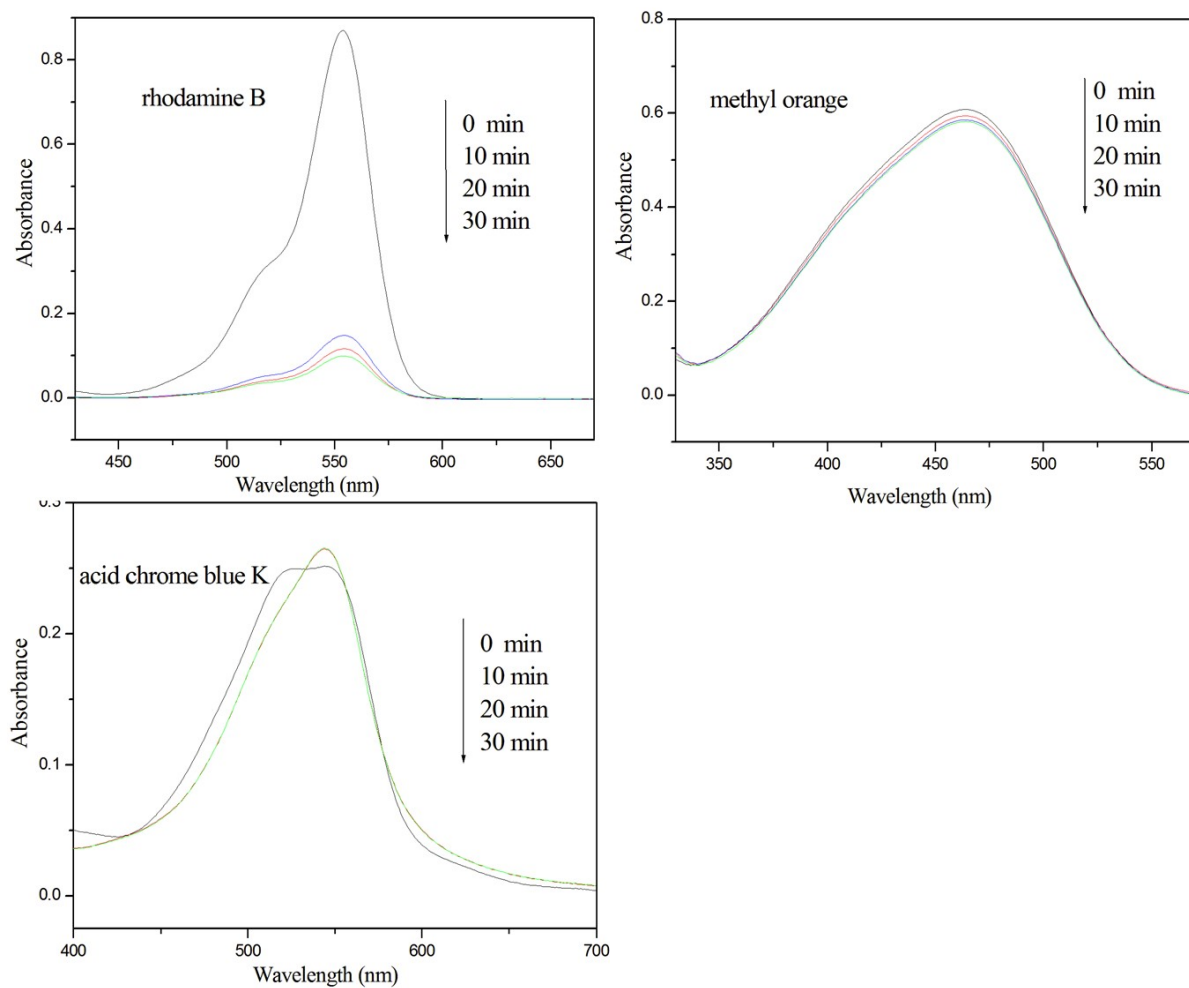


Fig. S7. UV-Vis spectra of aqueous solution of the NMOF **1b** sample with different dyes at different time intervals: rhodamine B, methyl orange, and acid chrome blue K.

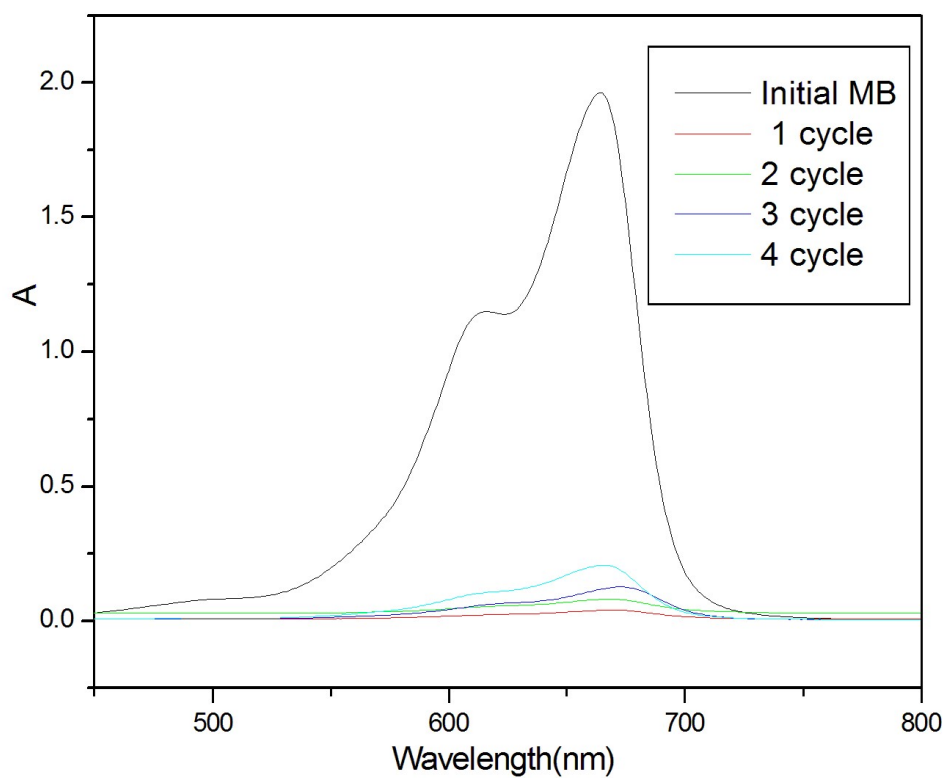


Fig. S8. UV-Vis spectra of MB adsorbed by the NMOF **1b** sample for four consecutive adsorption- desorption cycles.