Supporting information

Preparation and Exceptional Adsorption Performance of Porous MgO Derived from a Metal-Organic Framework

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Experimental section

In the adsorption experiments of MgO towards CR, The absorbances of the CR solutions before and after adsorption were tested by using the spectrophotometer. C_0 is the concentration of CR (mg/L) before adsorption. The C_e was obtained according to the Bill-Lambert law.

$A = alc$

a is the absorption coefficient, is the nature of the material.

l is the distance which the light passes through the sample.

c is the solution concentration.

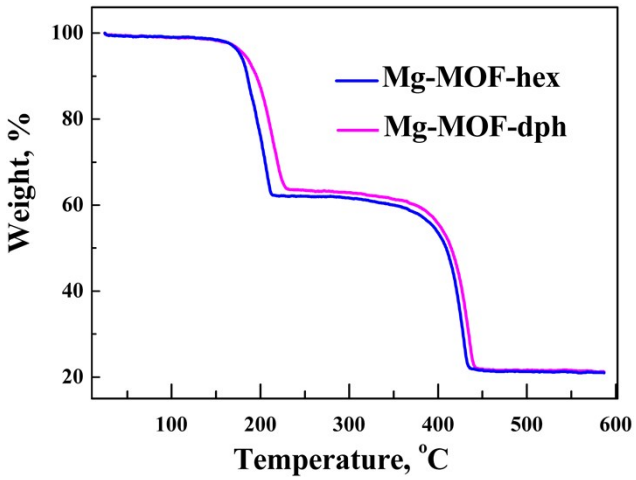

Fig. S1 TGA curves of Mg-MOF-hex and Mg-MOF-dhp.

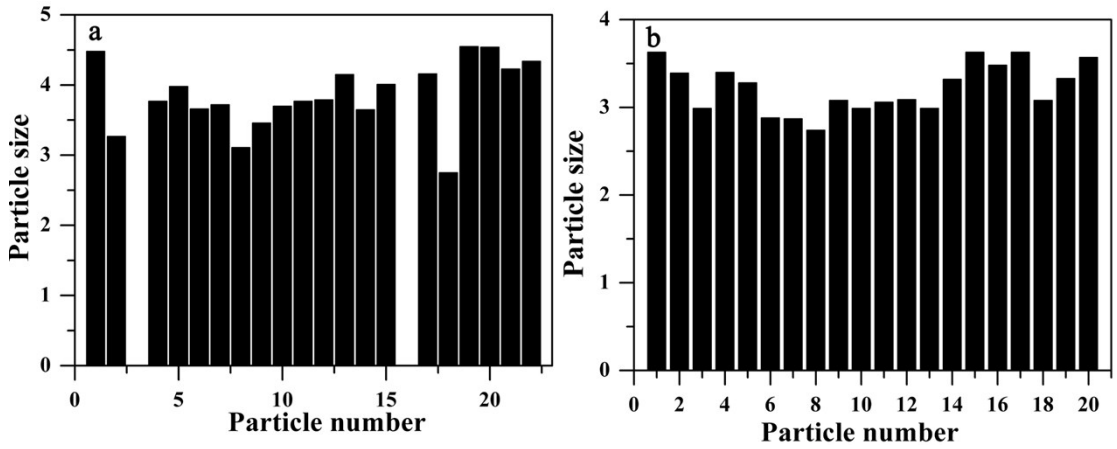

Fig. S2 The particle size and distribution of the Mg-MOF-hex (a) and Mg-MOF-dhp (b).

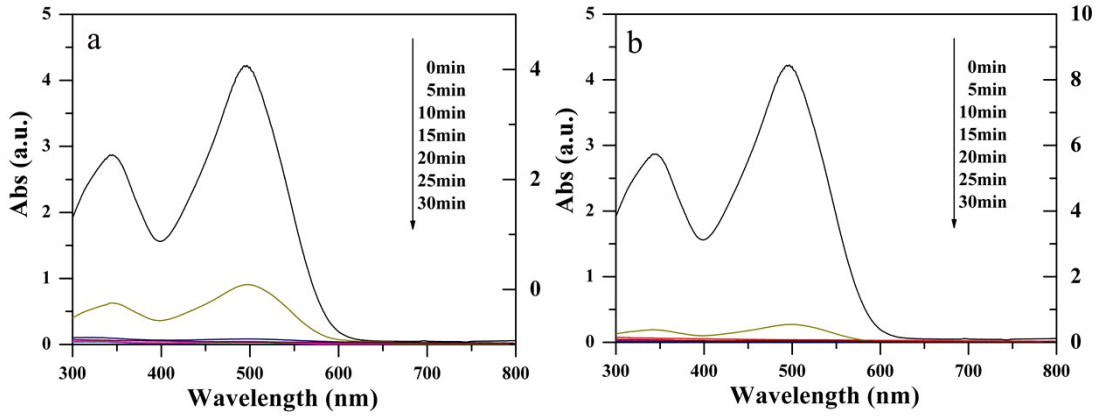

Fig. S3 UV-vis adsorption spectra of CR solutions (250 mg/L) before and after being treated by 0.6 g/L MgO-hex (a) and MgO-dhp (b) for different time periods, respectively.

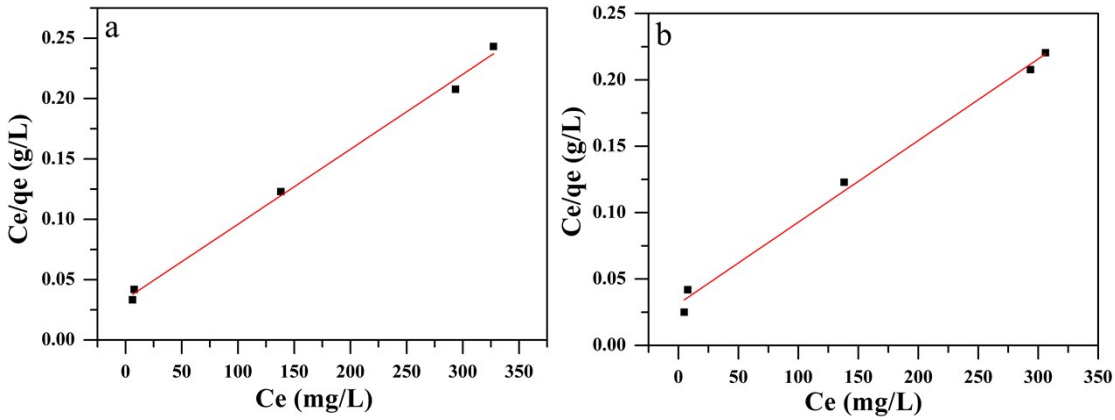

Fig. S4 Fitting plots of Langmuir isotherm model for CR adsorption on MgO-hex (a) and MgO-dhp (b).

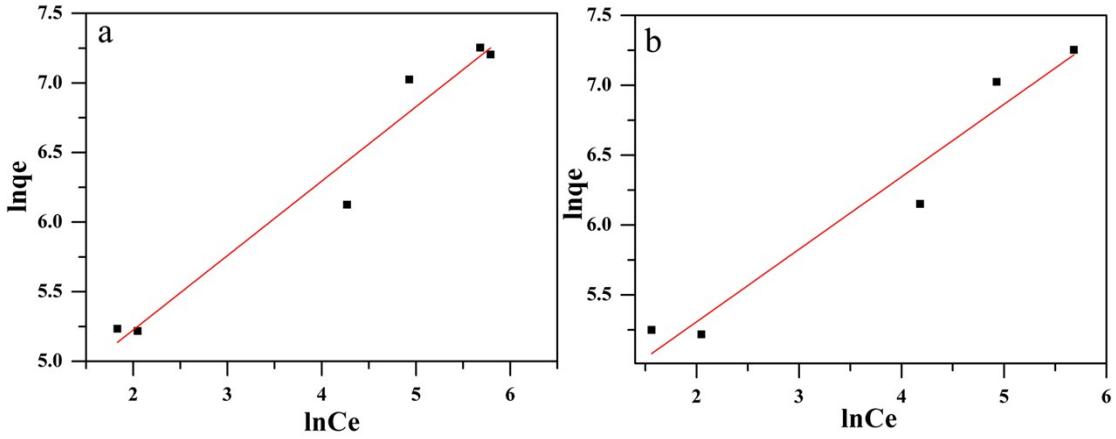

Fig. S5 Fitting plots of Freundlich isotherm model for CR adsorption on MgO-hex (a) and MgO-dhp (b).

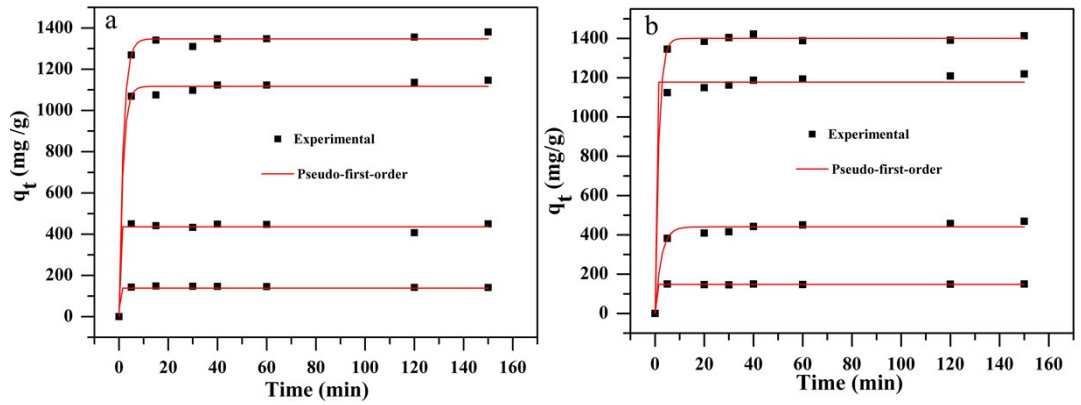

Fig. S6 Pseudo-first-order kinetics plots of CR adsorption on MgO-hex (a) and MgO-dhp (b).

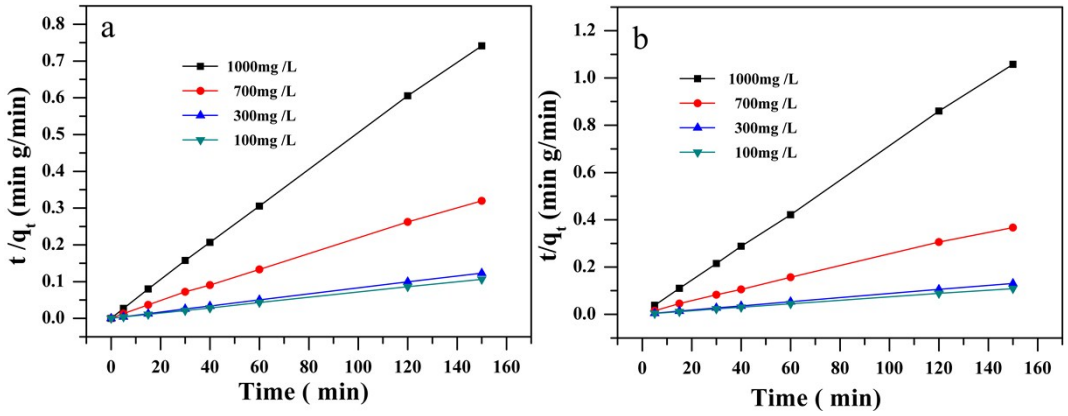

Fig. S7 Pseudo-second-order kinetics plots of CR adsorption on MgO-hex (a) and MgO-dhp (b).

Table S1 Adsorption parameters of isotherm for CR adsorption on MgO-hex

Langmuir			Freundlich		
q_m (mg/g)	K_L	R^2	K_f	n	R^2
1610	0.0184	0.992	63.82	1.87	0.953

Table S2 Adsorption parameters of isotherm for CR adsorption on MgO-dhp

Langmuir			Freundlich		
q_m (mg/g)	K_L	R^2	K_f	n	R^2
1626	0.0196	0.993	71.62	1.93	0.955

Table S3 Adsorption parameters of kinetics for CR adsorption on MgO-hex

Initial concentration (mg/L)	Pseudo-first-model				Pseudo-second-model			
	Experimental q_e (mg/g)	Calculated q_e (mg/g)	K_1 (g/mg/min)	R^2	Experimental q_e (mg/g)	Calculated q_e (mg/g)	K_2 (g/mg/min)	R^2
100	147.4	138.5	0.0165	0.992	147.4	148	0.0156	0.999
300	449	376.5	2.4657	0.960	449	411.5	0.0007	0.999
700	1146.9	1116.9	1.5926	0.995	1146.9	1150	0.0009	0.999
1000	1380	1347.1	1.7563	0.997	1380	1380	0.0008	0.999

Table S4 Adsorption parameters of kinetics for CR adsorption on MgO-dhp

Initial concentration (mg/L)	Pseudo-first-model				Pseudo-second-model			
	Experimental q_e (mg/g)	Calculated q_e (mg/g)	K_1 (g/mg/min)	R^2	Experimental q_e (mg/g)	Calculated q_e (mg/g)	K_2 (g/mg/min)	R^2
100	150	145	1.6966	0.993	150	147.1	0.0045	0.999
300	450	440	2.4879	0.976	450	450.5	0.0011	0.999
700	1207.8	1119.8	0.3468	0.991	1207.8	1220	0.0010	0.999
1000	1403	1401.1	0.0567	0.882	1403	1405	0.0046	0.999