Supplementary Information for

Synthesis of porous $MgAl_2O_4$ spinel and its superior performance for organic dye adsorption

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CAPTIONS:

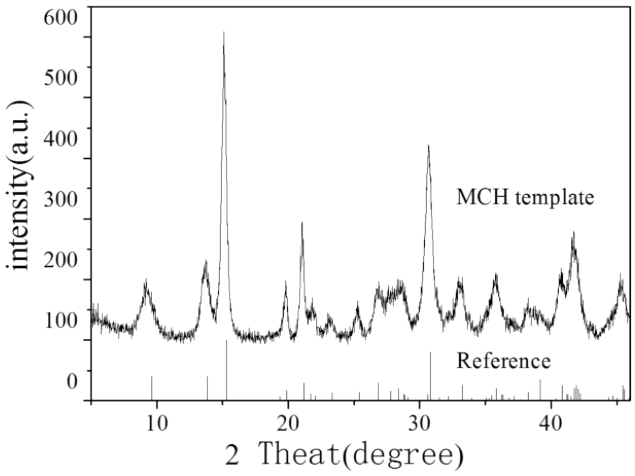


Fig. S1 Powder XRD pattern of MCH template and reference $Mg_5(OH)_2(CO_3)_4 \cdot 4H_2O$ (JCPDS Card No. 25-0513)

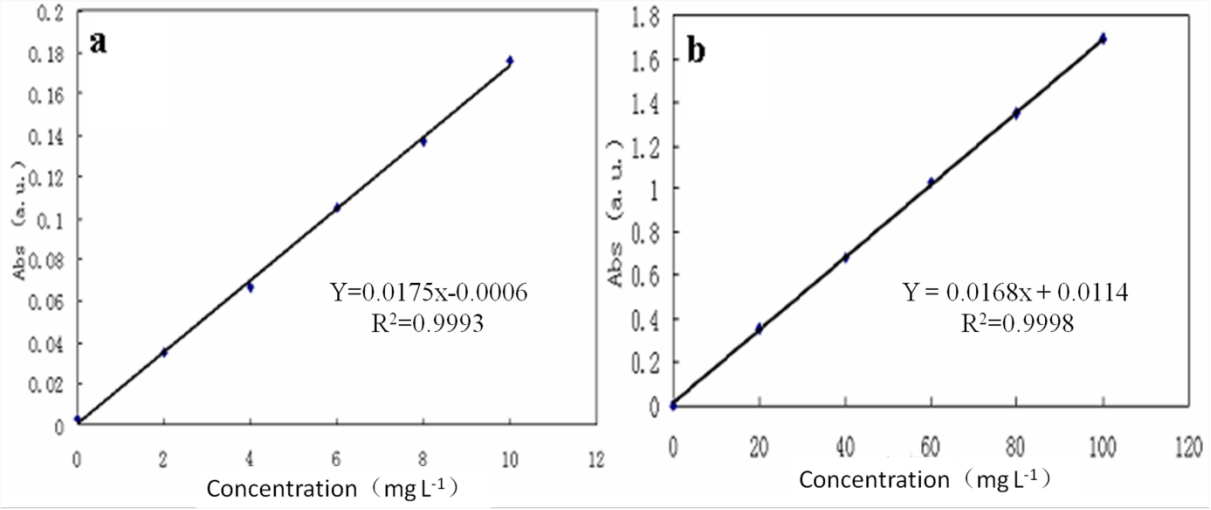


Fig. S2 Calibration curves for relationship between absorbance and concentration in different concentration ranges: (a) 0~10mg L^{-1} and (b) 10~100mg L^{-1}

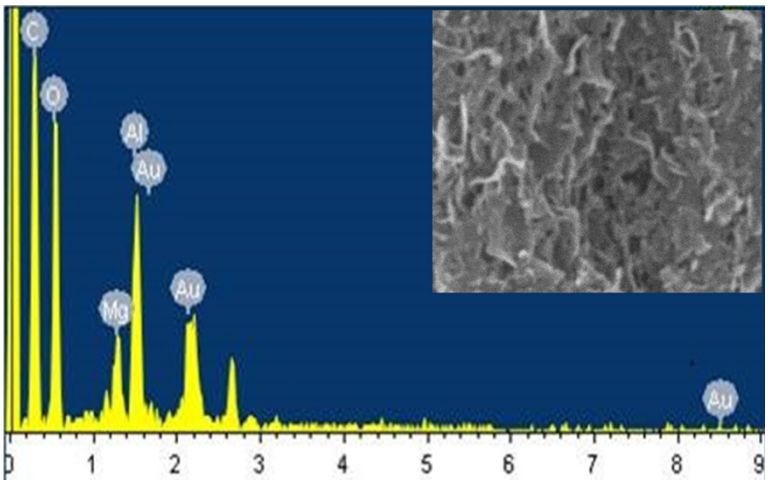


Fig. S3 EDX pattern of as-prepared MAS sample

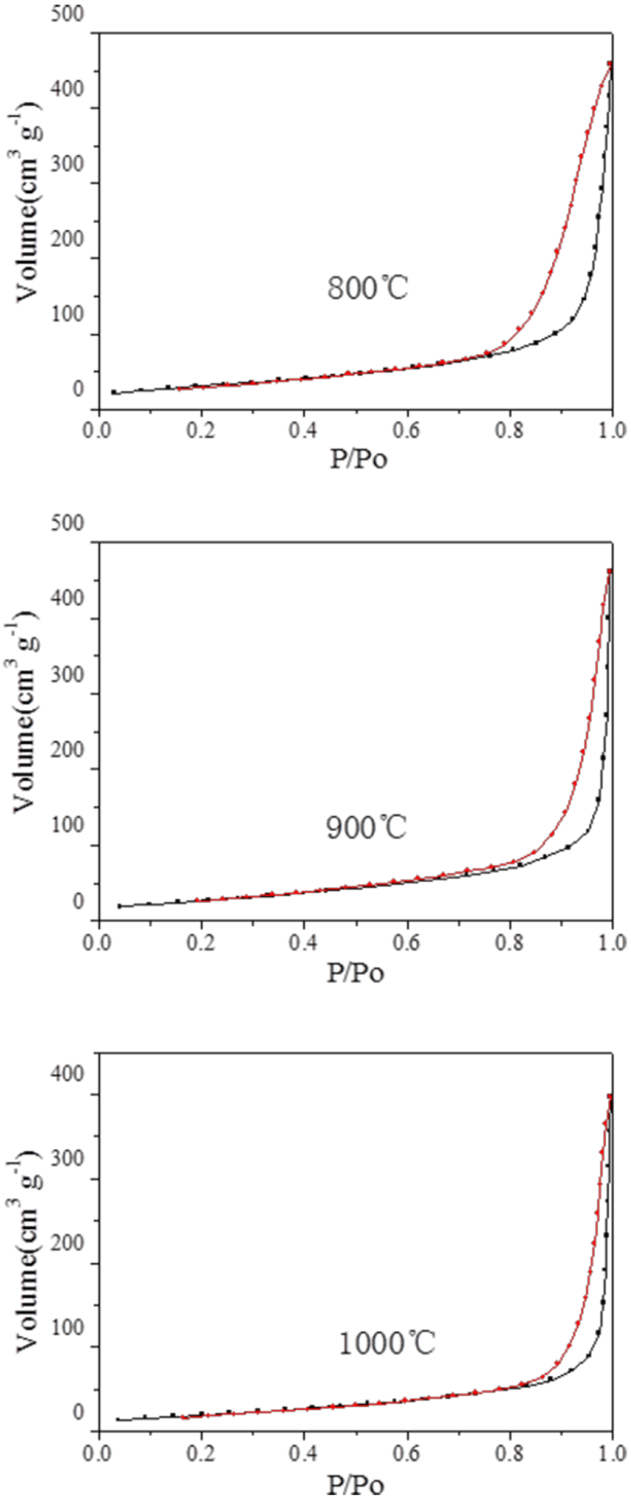


Fig. S4 N_2 ad/desorption isotherms of samples calcined at 800, 900 and 1000℃.

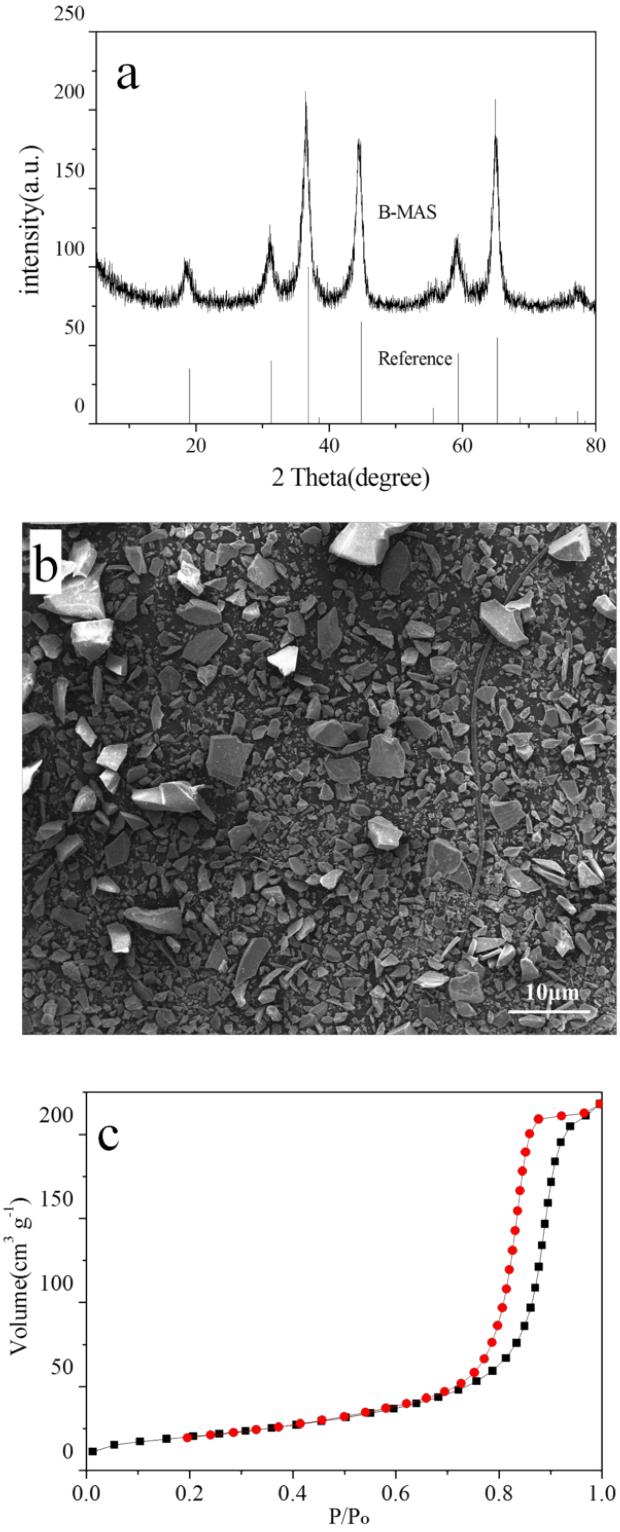


Fig.S5 (a) Powder XRD pattern, (b) SEM image and (c) N_2 ad/desorption isotherms of the bulk MAS

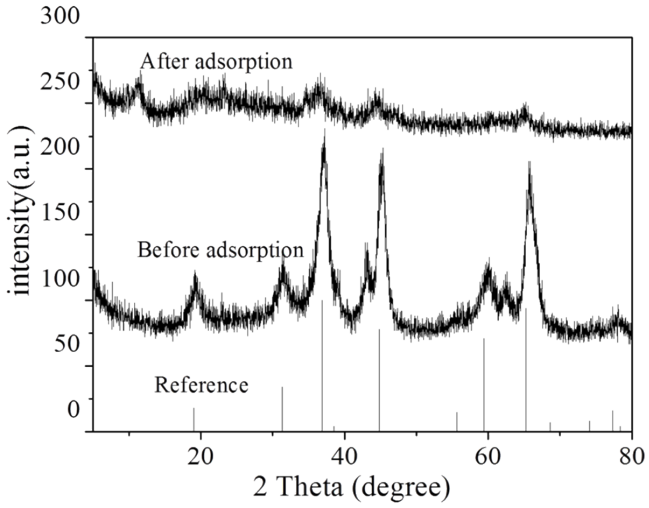


Fig.S6 Powder XRD patterns of the MAS powder before adsorption, after adsorption and reference MAS (JCPDS Card No. 77-1203)

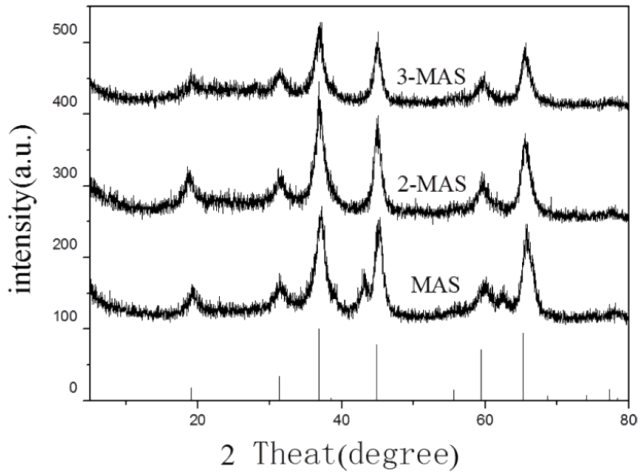


Fig. S7 Powder XRD patterns of MAS, 2-MAS, 3-MAS and reference MAS (JCPDS Card No. 77-1203).

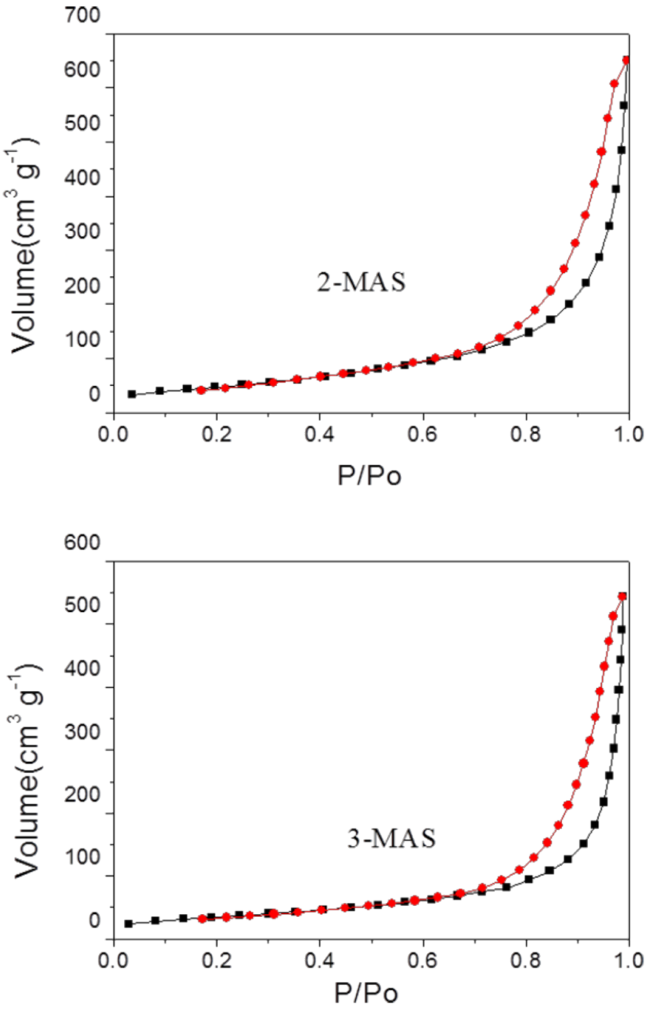


Fig. S8 N_2 ad/desorption isotherms of 2-MAS and 3-MAS samples

Table S1 Detail information of the CR used in the experiment

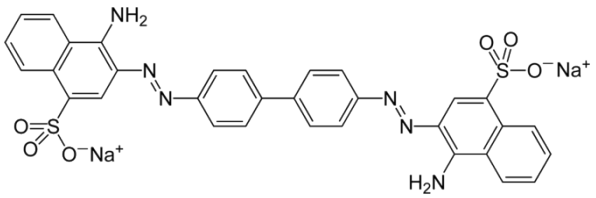
Molecular Formula	$C_{32}H_{22}N_6Na_2O_6S_2$
Structural Formula	
Molar Mass	696.66
CAS Number	573-58-0

Table S2 Kinetics parameters for the adsorption of Congo red on MAS powder

		Pseudo-first-order model			Pseudo-second-order model			Intraparticle diffusion model		
C_0 (mg L^{-1})	$q_{e,exp}$ (mg g^{-1})	$q_{e,cal}$ (mg g^{-1})	k_1 (min^{-1})	R^2	$q_{e,cal}$ (mg g^{-1})	k_2 (g mg^{-1} min^{-1})	R^2	k_3 (mg g^{-1} $min^{-1/2}$)	C (mg g^{-1})	R^2
200	396.7	385.1	0.4496	0.6380	398.4	0.002582	0.9999	3.419	358.7	0.6443
300	595.7	576.3	0.5016	0.4218	598.8	0.00167	0.9999	4.989	539.4	0.7659
400	794.5	728.6	0.3075	0.4121	806.5	0.000409	0.9998	15.67	608.8	0.8371

Table S3 Isotherm parameters for the adsorption of Congo red on MAS powder

Langmuir			Freundlich			Sips			
$q_{m,}$ (mg g^{-1})	b	R^2	K_f	n	R^2	$q_{m,}$ (mg g^{-1})	K_s	γ	R^2
863.6	998.4	0.6995	565.2	11	0.4958	845.5	589.1	0.6119	0.9738