Electronic Supplementary Material (ESI) for Dalton Transactions.

Template-free synthesis of nanoparticle-built MgO and Zn-doped MgO hollow microspheres with superior performance for Congo red adsorption in water

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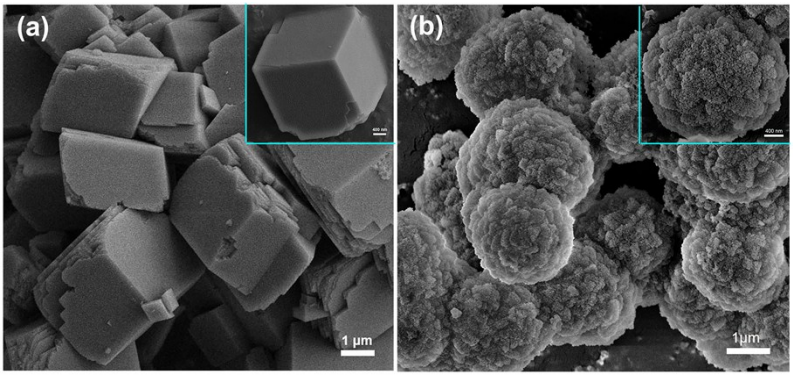

Fig. S1. SEM images of pure MgO prepared at different conditions: (a) without TSC, (b) with TSC.

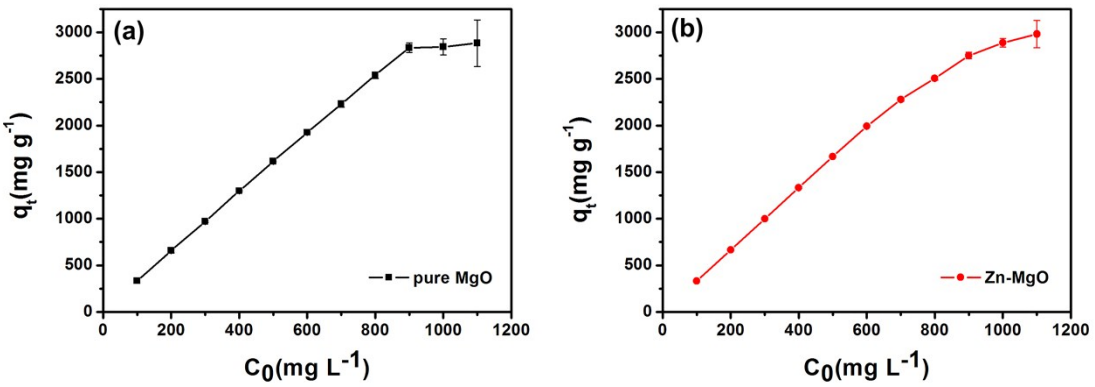

Fig. S2. Effect of initial concentrations for CR removal on (a) pure MgO and (b) Zn-MgO.

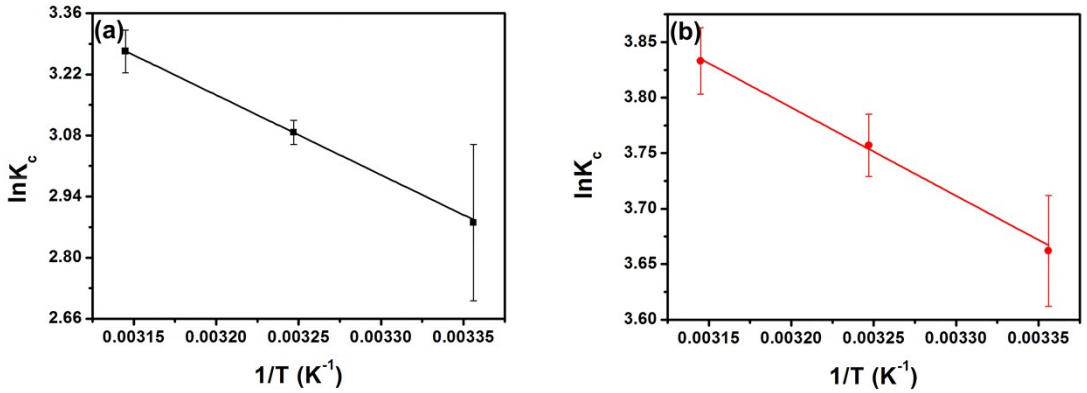

Fig. S3. The linear plot of lnK_C versus *1/T* for (a) pure MgO and (b) Zn-MgO (adsorbent dose = 0.3 g L^{-1}; CR concentration = 700 mg L^{-1}; time=150 min).

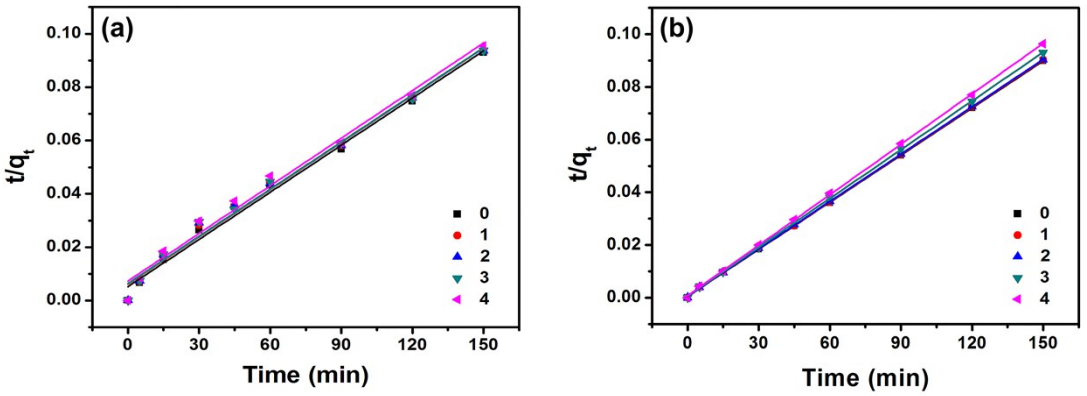

Fig. S4. Pseudo-second-order kinetics for CR adsorption on (a) pure MgO and (b) Zn-MgO in the recycling experiments, respectively.

Table S1

Recycling adsorption kinetic parameters for the CR removal on pure MgO and Zn-MgO.

Adsorbent	Cycle time	$q_{e,exp}$ (mg g^{-1})	Pseudo-second-order kinetic models		
			k_2 [(g mg^{-1} min^{-1})]	$q_{e,cal}$ (mg g^{-1})	R^2
pure MgO	0	1617.6	6.7×10^{-5}	1696.97	0.9905
	1	1600.24	5.7×10^{-5}	1693.59	0.9881
	2	1602.67	5.4×10^{-5}	1697.53	0.9868
	3	1600.24	5.4×10^{-5}	1696.58	0.9867
	4	1570.73	4.9×10^{-5}	1680.51	0.9835
Zn-MgO	0	1666.67	0.00074	1678.06	0.9999
	1	1660.66	0.00061	1673.66	0.9999
	2	1660.31	0.00060	1668.80	0.9999
	3	1613.44	0.00056	1621.23	0.9999
	4	1657.88	0.00054	1565.63	0.9998