Supplementary Information for

Shape-controlled synthesis of α-Fe_2O_3 nanocrystals for efficient adsorptive removal of Congo red

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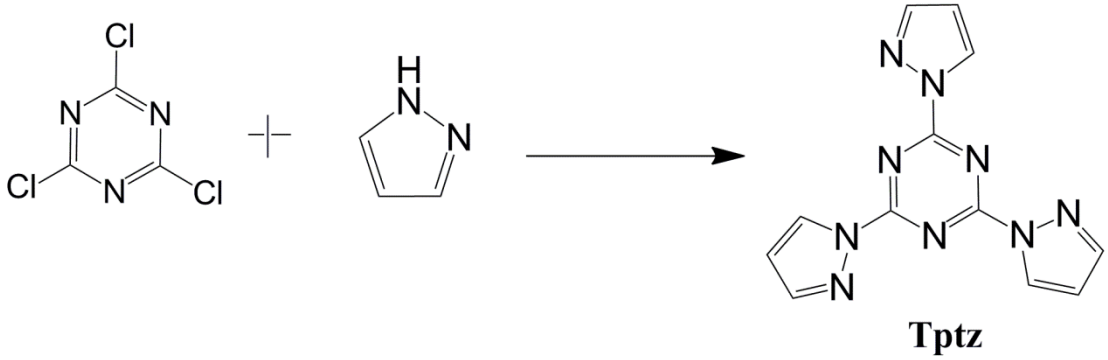
Contents:

Synthesis of the ligand 2,4,6-Tris(pyrazol-1-yl)-1,3,5-triazine (Tptz)

Tptz can be easily obtained via the reported method.[1] Typically, cyanuric chloride (1.84 g, 10 mmol) and pyrazole (4.08 g, 60 mmol) were mixed and stirred rapidly without solvent for 5 min at 60 ºC. Then, the reaction mixture was dissolved in 100 mL chloroform and washed with 100 mL distilled water. The organic layer was collected and aqueous layer was further extracted with chloroform (3×50 mL). The combined organic layer was dried over anhydrous $MgSO_4$ and evaporated to dryness. The resulting white powder was collect and the ^{1}H-NMR data were identical with those reported in literature.



Tptz

1 D. Azarifar, M. A. Zolfigol and A. Forghaniha, *Heterocycles*, 2004, **63**, 1897-1901.

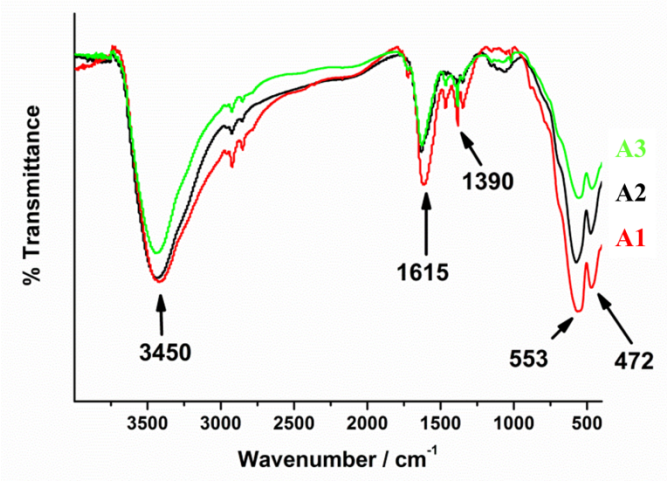


Fig. S1. The FT-IR spectrum of the obtained products A1, A2 and A3.

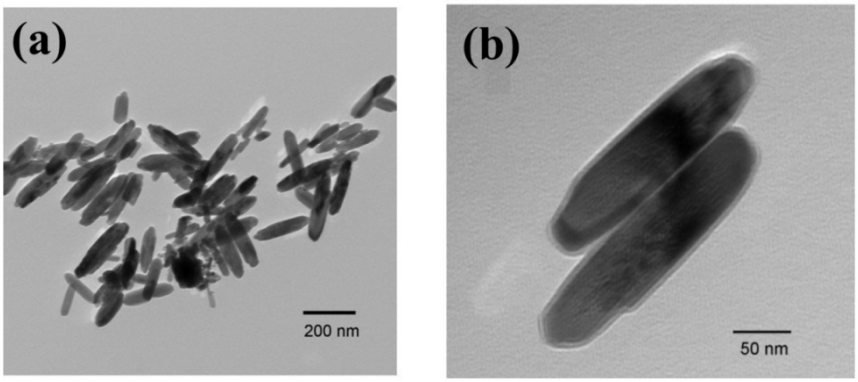


Fig. S2. TEM images of the products obtained from pure H_2O. (a, scale bar = 200 nm; b, scale bar = 50 nm).

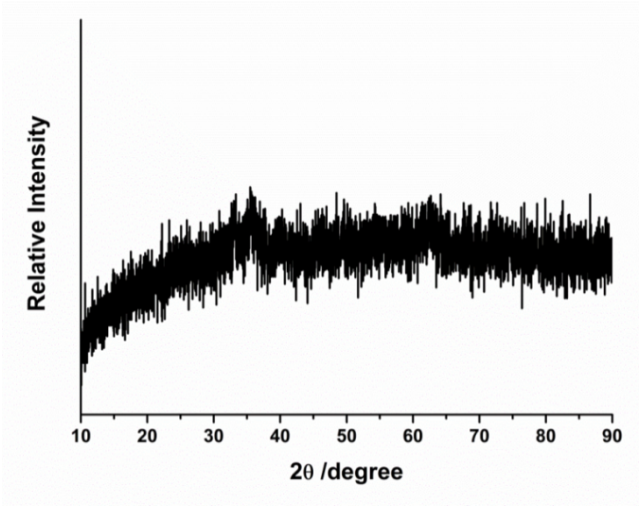


Fig. S3. PXRD pattern of the synthesized sample in pure H_2O.

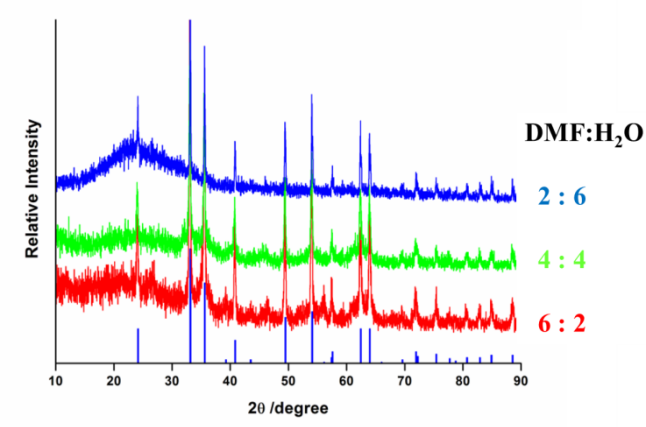


Fig S4. PXRD patterns of the synthesized samples in the absence of Tptz in three kinds of mixed solvent DMF/H_2O.

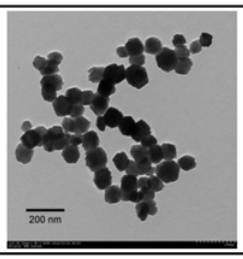
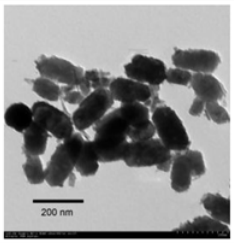
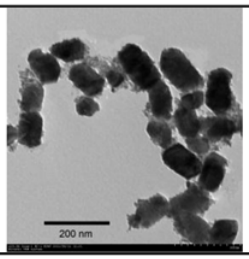
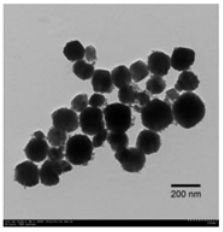
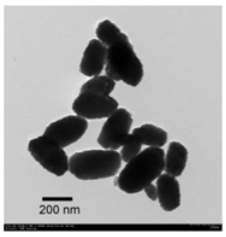
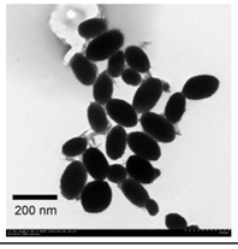
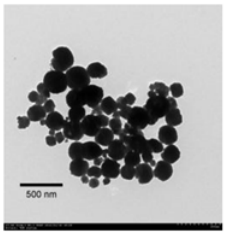
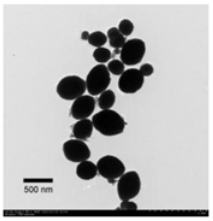
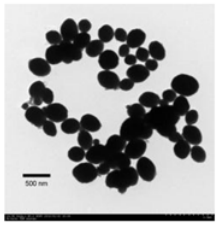
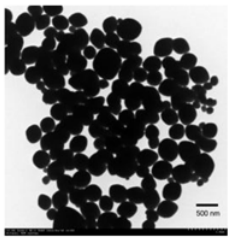
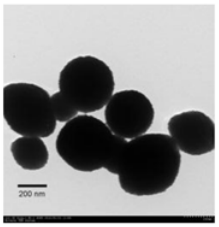
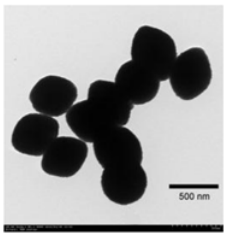
TPTz:$FeCl_3 \cdot 6H_2O$	DMF/H_2O=6:2 mL	DMF/H_2O=4:4 mL	DMF/H_2O=2:6 mL
0.1:0.2 mmol			
0.3:0.2 mmol			
0.4:0.2 mmol			
0.5:0.2 mmol			

Fig S5. TEM images of the samples obtained from different solvent DMF/H_2O in the presence of 0.1-0.5 mmol Tptz.

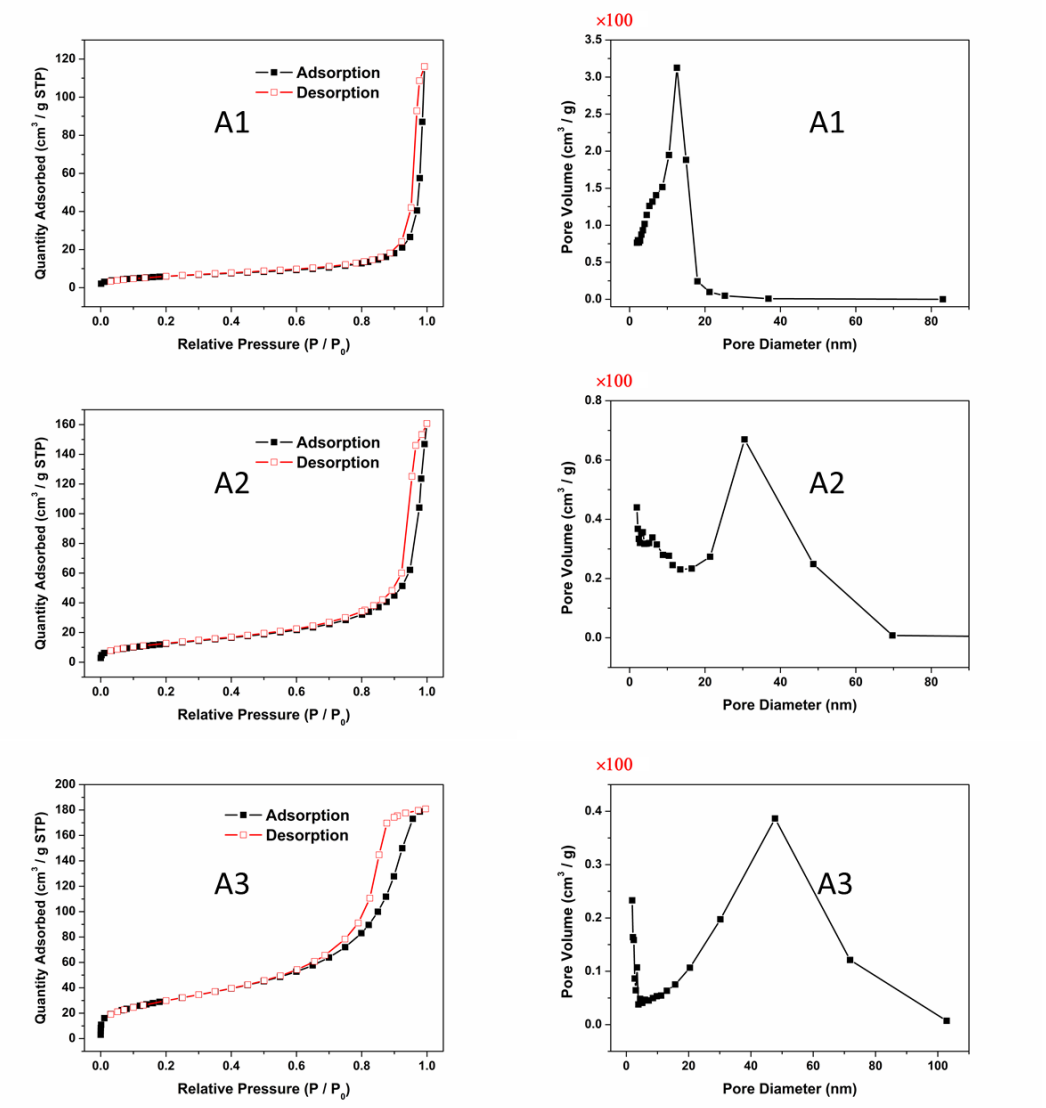


Fig. S6. Nitrogen adsorption−desorption isotherms (left) and Barrett-Joyner-Halenda (BJH) pore size distribution profiles (right) of A1, A2 and A3.

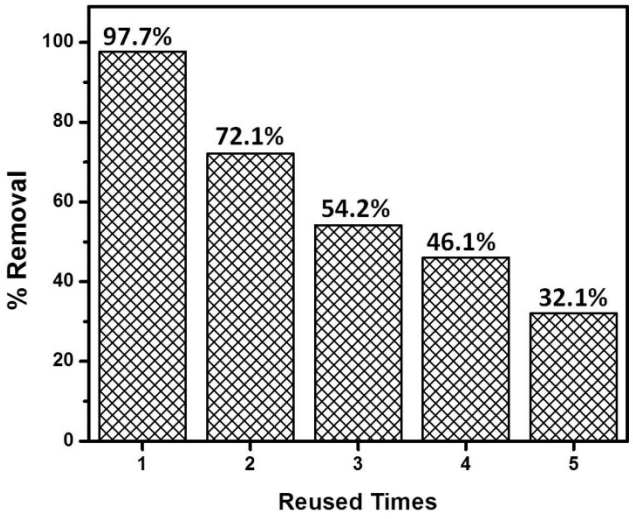


Fig. S7. Recycle test of CR removal efficiency of α-Fe_2O_3 A3.