Electronic Supplementary Information

Zeolitic Imidazolate Framework-8 Coated Fe_3O_4@SiO_2 Composites for Magnetic Solid-Phase Extraction of Bisphenols

Jinfei Liu, Huijiao Qiu, Fei Zhang*, Yan Li*

Key Laboratory of Inorganic-Organic Hybrid Functional Materials Chemistry (Tianjin Normal University), Tianjin Key Laboratory of Structure and Performance for Functional Molecule, College of Chemistry, Tianjin Normal University, Tianjin, 300387, P.R. China.

* E-mail: nkliyan398@gmail.com (Y. Li)

hxxyzf@tjnu.edu.cn (F. Zhang)

Synthesis of Fe_3O_4

Briefly, a mixture of $FeCl_3 \cdot 6H_2O$ (1.35 g) and anhydrous sodium acetate (3.60 g) in glycol (40 mL) was stirred vigorously for 30 min, then transferred into a Teflon-lined autoclave and reacted at 200 ˚C for 8 h to give Fe_3O_4 magnetic microspheres. After cooling to room temperature, the black magnetic microspheres were collected by a magnet, washed with ethanol and ultrapure water 4 times, and then the products were dried under vacuum at 60 ˚C for 12 h.

Synthesis of Fe_3O_4@SiO_2

Fe_3O_4 microspheres (0.10 g) were first dispersed in a mixture of ethanol (100 mL), H_2O (20 mL) and concentrated ammonia aqueous solution (0.5 mL, 25-28%, w/w) with the help of ultrasonication. After the mixed solution was sonicated for 4 h, TEOS (0.5 mL) was added into the above dispersion. Subsequently, the reaction was allowed to proceed for 4 h. Finally, the Fe_3O_4@SiO_2 microspheres were separated using a magnet and washed with ethanol and ultrapure water 4 times, and then dried under vacuum at 60 ˚C for 12 h.

Carboxyl modification of Fe_3O_4@SiO_2

APTES silane coupling agent and glutaric anhydride were used to modify carboxyl on the Fe_3O_4@SiO_2 microspheres. Typically, glutaric anhydride (0.168 g), APTES (0.455 mL) and DMF (12 mL) were mixed in a 50 mL round-bottom flask and stirred for 3 h at 60 ˚C. Subsequently, the hybrid solution containing Fe_3O_4@SiO_2 microspheres (0.300 g), DMF (10 mL), and H_2O (0.9 mL) was added to the above dispersion and stirred for 5 h. Finally, the products were separated by a magnet and washed with ethanol 4 times, and then dried under vacuum at 60 ˚C for 12 h.

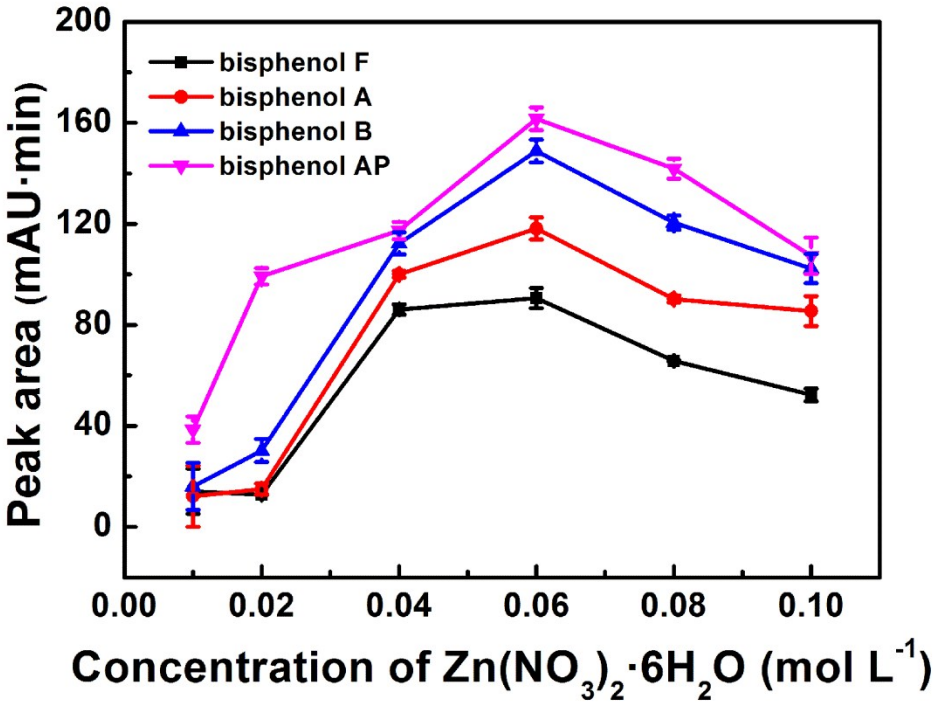
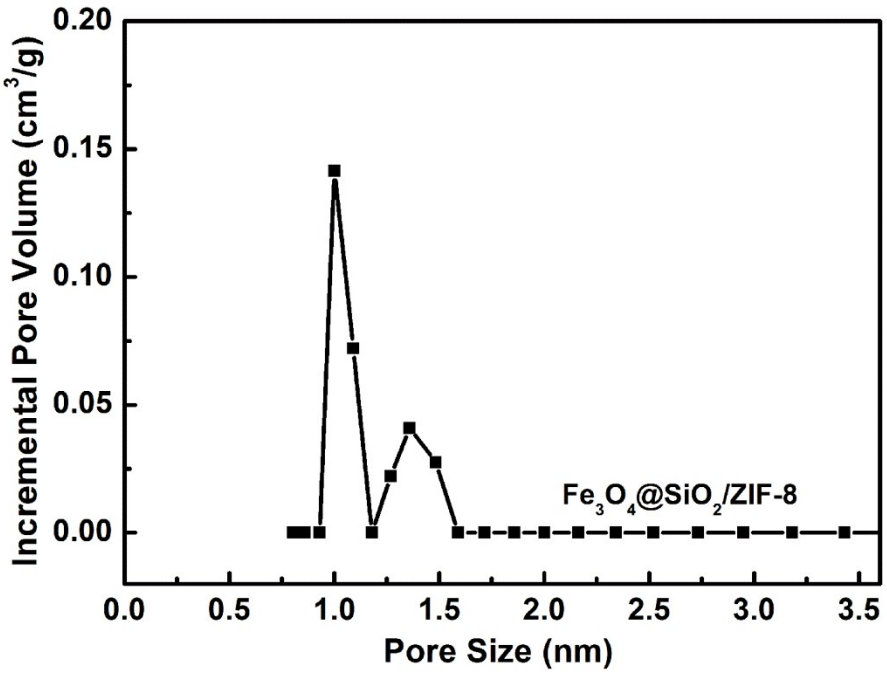


Fig. S1. Effect of the concentration of $Zn(NO_3)_2 \cdot 6H_2O$ on the extraction efficiency of bisphtnols (The concentration of 2-methylimidazole in the solution was always 3:1 to $Zn(NO_3)_2 \cdot 6H_2O$).



1

2 Fig. S2. Pore size distribution curves of Fe_3O_4@SiO_2/ZIF-8.

3

Table S1 Instrumental operations conditions for HPLC.

parameter	setting
instrumental model	1260 series
column type	reversed phase C18 column (5 μm, 4.6 mm × 250 mm,)
column temperature	30 ˚C
the mobile phase	Acetonitrile, pure water
mobile phase ratio	Acetonitrile: 60% pure water: 40%
flow rate	0.9 mL/min
detection wavelength	225 nm
bandwidth	4 nm
injection volume	20 μL
run time	10 min