

Supplementary Information

Multifunctional Mesoporous Material for Detection, Adsorption and Removal of Hg^{2+} in Aqueous

Solution

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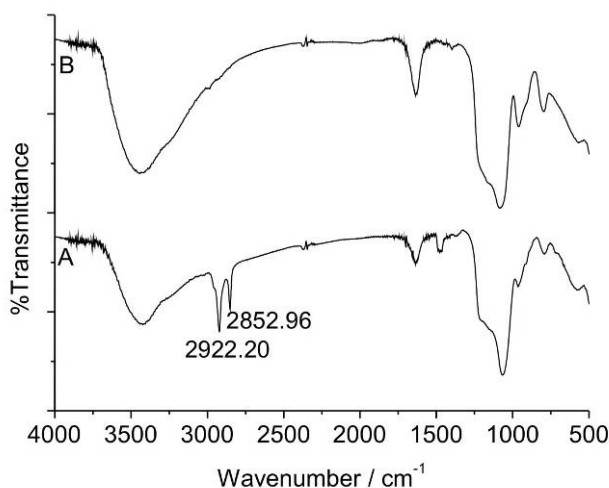


Figure S1 The FT-IR spectra of $\text{Fe}_3\text{O}_4@\text{nSiO}_2@\text{mCTAB}/\text{SiO}_2$ (a) and $\text{Fe}_3\text{O}_4@\text{nSiO}_2@\text{mSiO}_2$ (b).

The bands observed in the region $2800\text{--}3000\text{ cm}^{-1}$ are attributed to the vibrations of $-\text{CH}_2$ of CTAB templates. After ethanol containing NH_4NO_3 extraction, no adsorption peaks were observed in the range of $2800\text{--}3000\text{ cm}^{-1}$ for the $\text{Fe}_3\text{O}_4@\text{nSiO}_2@\text{mSiO}_2$ microspheres, suggesting that the CTAB templates are completely removed.

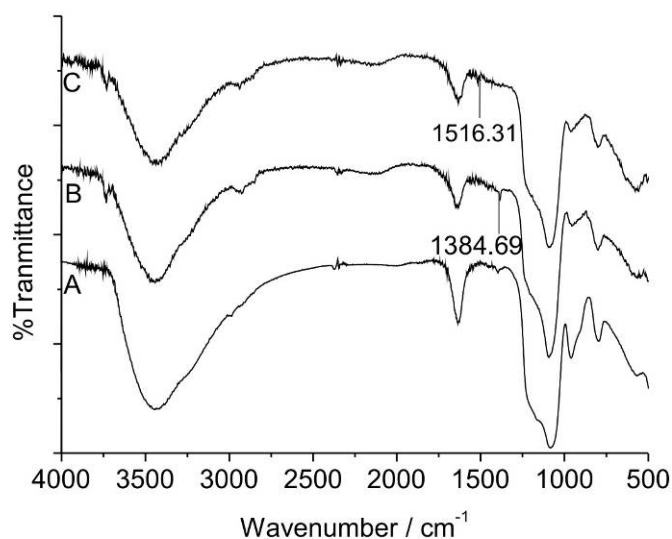


Figure S2 Time-dependent fluorescence intensity of the porphyrin-doped silica film upon exposure to toluene vapour.

In the IR spectrum, the characteristic absorption band of Fe-MME appears at 1384 cm^{-1} is corresponding to the stretching vibration of the grafted -C-O-C- group. The new peak at 1516 cm^{-1} belongs to bending vibration of δ N-H, proves the formation of amide groups in the MMMs.