Electronic Supplementary Information (ESI)

A novel magnetite C18/paracetamol/alginate adsorbent bead for simultaneous extraction of synthetic antioxidants and bisphenol A in water samples

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Dispersion of mC18/Pa/Alg beads in a solution

Separation of mC18/Pa/Alg beads by external magnet

Fig. S1 Dispersion and separation of the beads. The beads are easily separated from the water by an external magnet.

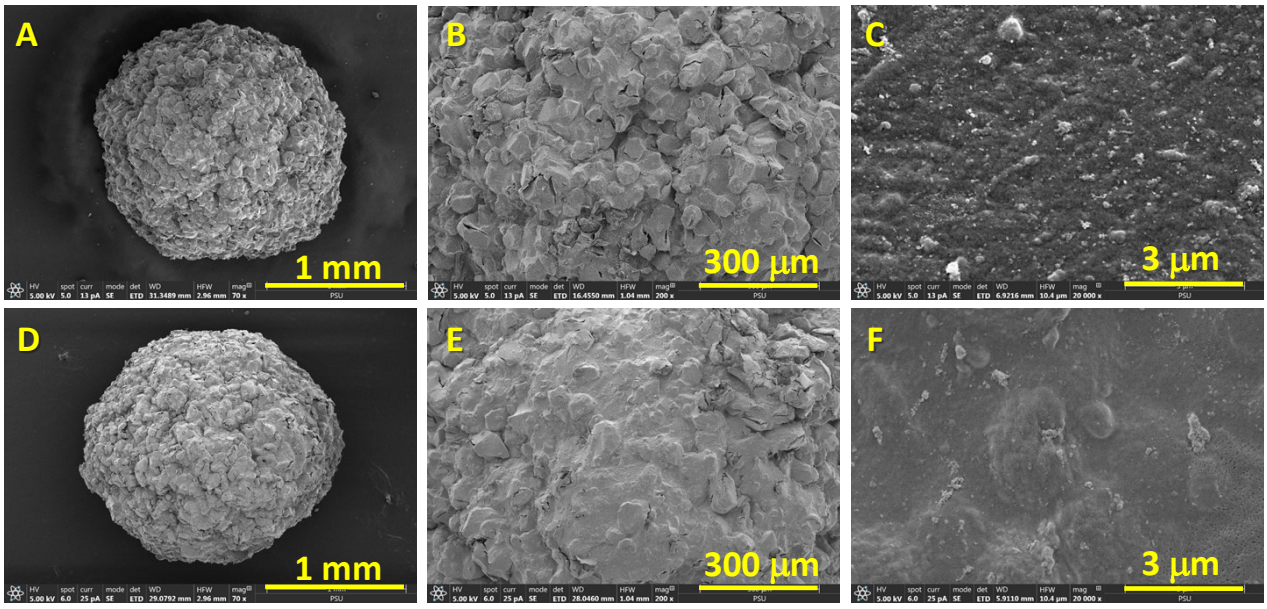

Fig. S2 FE-SEM images show (A–C) the mC18/Pa/Alg bead (with Pa), and (D–F) the mC18/Alg bead (without Pa) at 70X, 200X, and 20,000X magnifications, respectively. Pa stands for paracetamol.

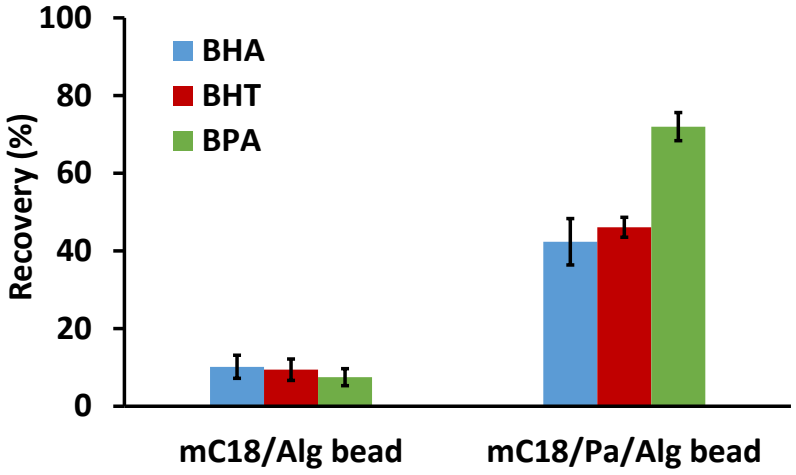

Fig. S3 Comparison of the extraction efficiency of BHT, BHA and BPA between the mC18/Alg bead (without Pa) and the mC18/Pa/Alg bead (with Pa).

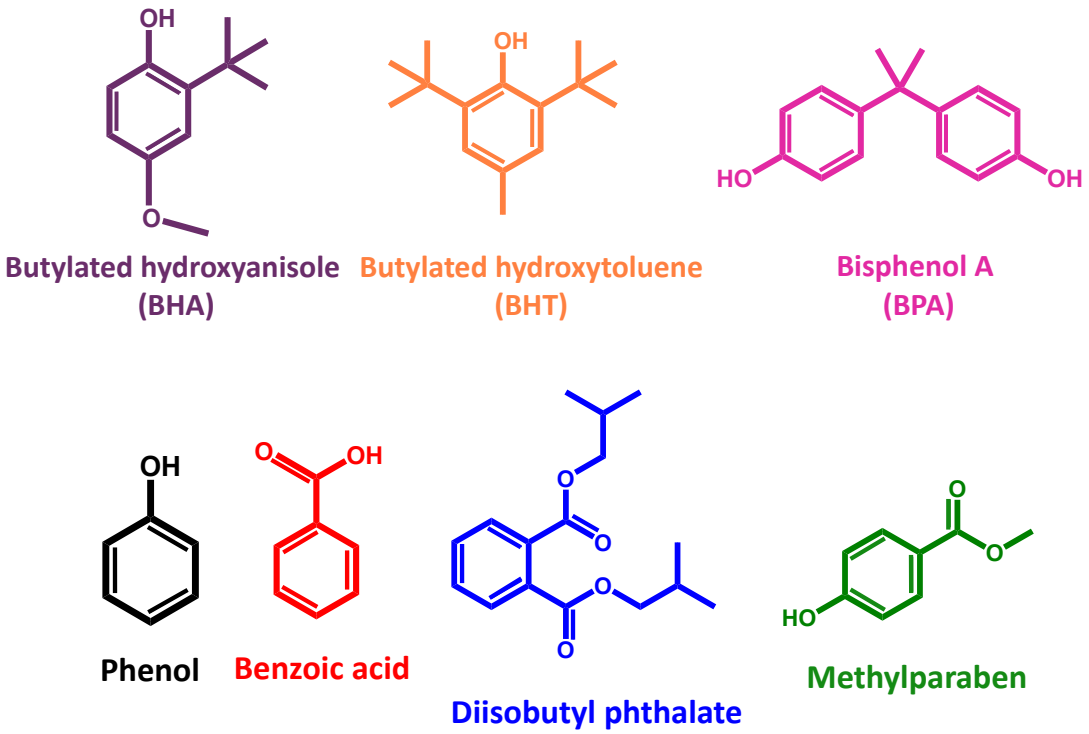

Fig. S4 Chemical structures of competitive aromatic compounds.

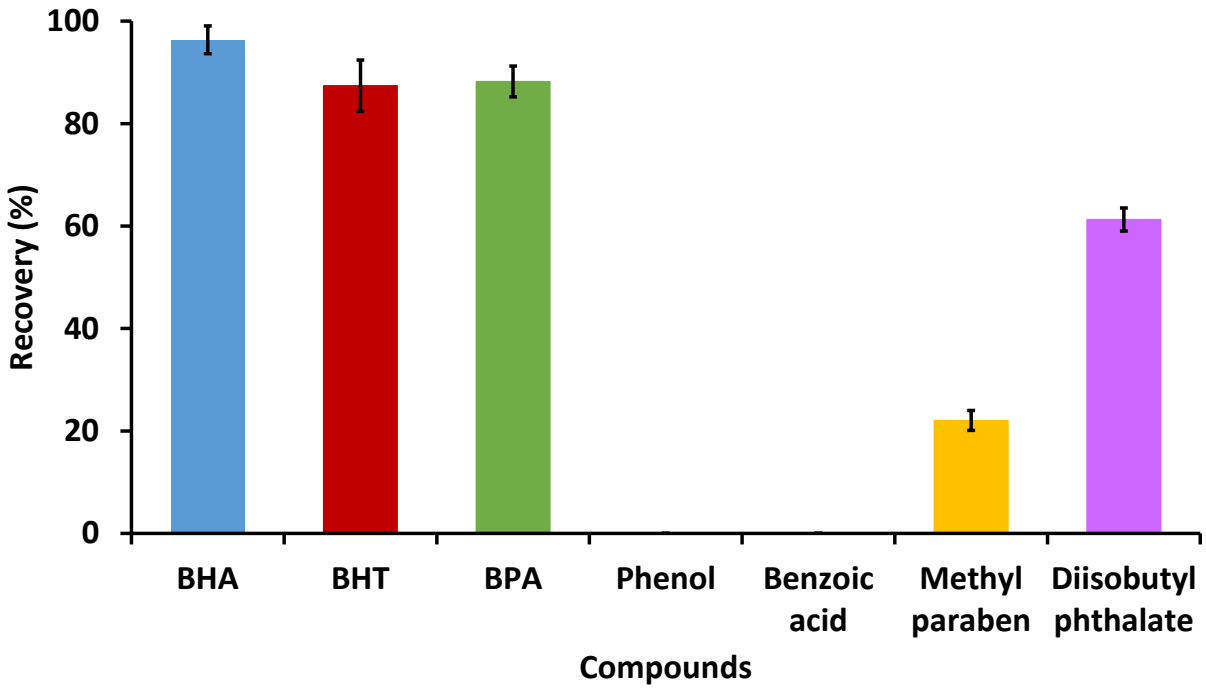

Fig. S5 The selectivity of BHA, BHT, BPA and competitive aromatic compounds.

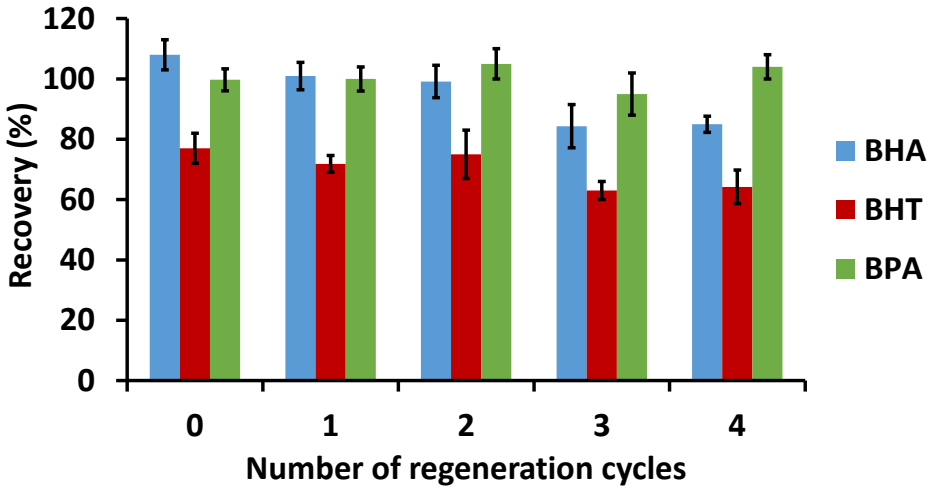

Fig. S6 Extraction recovery (%) of mC18/Pa/Alg during four regeneration cycles.

The adsorption capacity

The adsorption capacity was conducted as follows: the highest concentration of 0.5 μg mL^{-1} of standard mixture used to spike in real water samples was tested. The adsorption study was conducted in a 7−mL glass vial and optimal amounts of mC18/Pa/Alg beads (300 mg) were added into 3 mL water samples (n = 3). The solution was shaken for 30 min to allow the adsorption of analytes. Subsequently, the beads were isolated from the solution with a magnet. The residual concentration of BHA, BHT and BPA in the adsorbed solution was analyzed by UV-visible spectrophotometry. The equilibrium adsorption capacity, q_e (mg g^{-1}) was calculated as follows:

$$q_e = \frac{(C_0 - C_e)V}{m}$$

where C_0 is the concentration in the original solution (mg L^{-1}), C_e is the concentration in the adsorbed solution (mg L^{-1}), V is the adsorption volume (L) and m is the dry weight of the beads (g).[1]

Reference

1. X. Zhang, T. Zeng, S. Wang, H. Niu, Xi. Wang and Y. Cai, One-pot synthesis of C_{18}-functionalized core-shell magnetic mesoporous silica composite as efficient sorbent for organic dye, *J. Colloid Interface Sci.*, 2015, **448**, 189–196, DOI: 10.1016/j.jcis.2015.02.029.

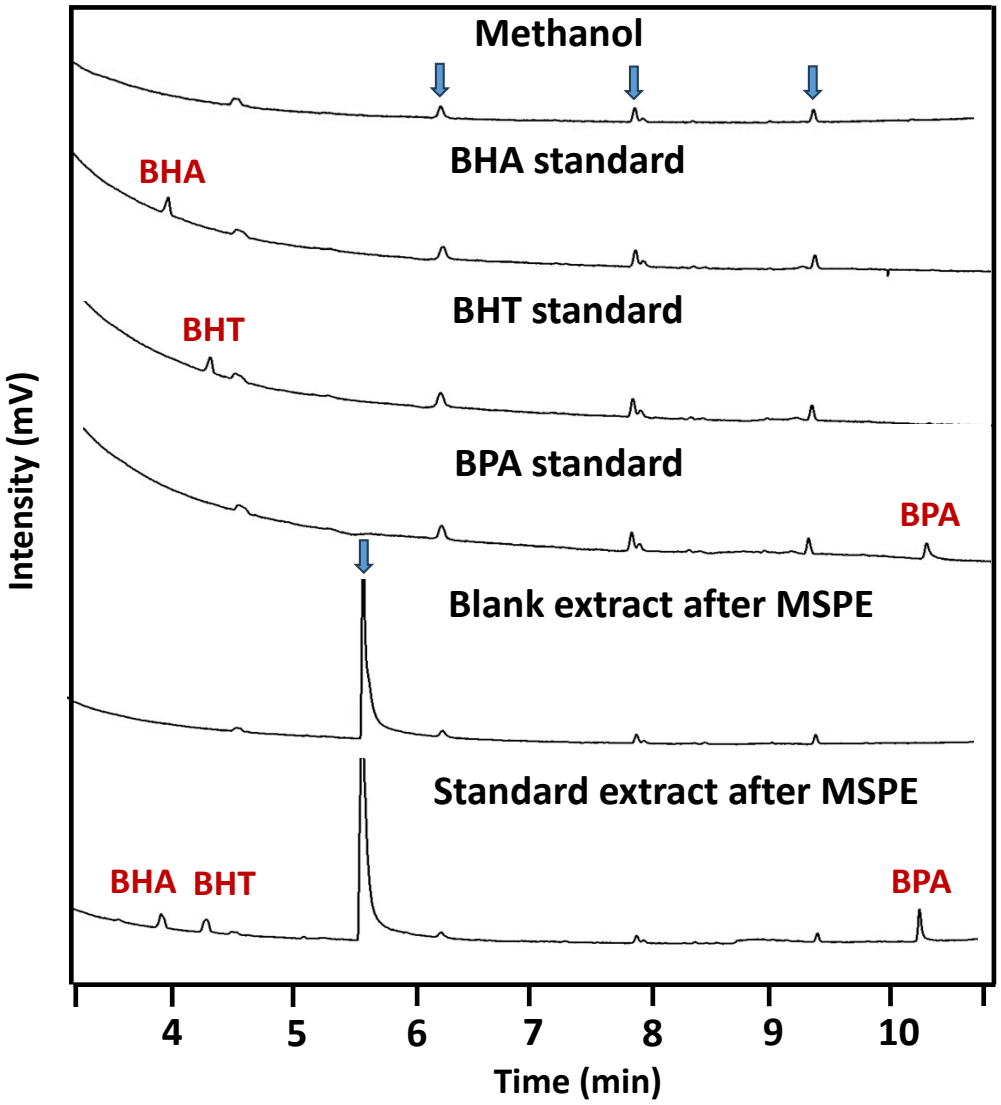

Fig. S7 GC-FID chromatograms of methanol, a standard solution (single BHA, BHT and BPA), a treated blank extract after MSPE and a treated standard extract after MSPE.