## SUPPLEMENTARY INFORMATION

## Fe<sub>3</sub>O<sub>4</sub>@Au Sphere Molecular Imprinting with Self–Assembled

## Monolayer for the Recognition of Parathion-Methyl

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## Preparation of core/shell Fe<sub>3</sub>O<sub>4</sub>@Au nanoparticles.

Firstly, 5.2 g of FeCl<sub>3</sub>·6H<sub>2</sub>O, 2.0 g of FeCl<sub>2</sub>·4H<sub>2</sub>O and 0.85 mL of HCl (12 M) were dissolved in 25 mL of deionized water (degassed with N<sub>2</sub> gas before use). Then, the solution was added dropwise into 250 mL of 1.5 M NaOH solution under vigorous stirring using nonmagnetic stirrer at 80 °C, resulting in a pale yellow solution which changed to brown and finally to dark black. The obtained Fe<sub>3</sub>O<sub>4</sub> nanoparticles were separated from the reaction medium by magnetic field, and washed twice with 100 mL deionized water, then twice with 0.1 M TMAOH, and the final precipitate was dispersed in 250 mL of 0.1 M TMAOH. The final, black solution was stored in air under benchtop conditions for further use.

 $Fe_3O_4/Au$  core/shell nanoparticles were prepared as following: to create a gold shell on the  $Fe_3O_4$  core, 12.5 mL of  $Fe_3O_4$  nanoparticles was diluted to 1.1 mM using 140 mL water, and this was stirred at 300–400 rpm with 7.5 mL of 0.1 M sodium citrate for 10 min. Aliquots of 750µL 0.2M NH<sub>2</sub>OH·HCl and 625µL 1% HAuCl<sub>4</sub> were then added incrementally, causing an immediate color change from black to reddish brown, and it was left stirring for an hour at room temperature. An aubergine precipitation was separated with a magnet and washed with distilled water twice to remove any nonmagnetic particles, and stored at 4°C in a refrigerator.



Figure S1 Structural formulas of the pesticide compounds used in this study



**Figure S2** Cyclic voltammograms of the SMIM-GC electrode in  $30\mu$ M solution of parathion-methyl at various scan rate. From a to k, scan rate is 20, 40, 60, 80, 100, 120, 140, 180, 220, 260, 300 mV s<sup>-1</sup>. Inset: the relationship between reductive peak current and the scan rate, and the linear relation showing that the electron transfer for parathion-methyl at the SMIM-GC electrode is surface-confined process



**Figure S3** CVs of imidacloprid (50  $\mu$ M) on a bare GC electrode (a) and on the SMIM electrode (b), showing that the imidacloprid does not produce a peak on the MIP-modified electrode



Figure S4 CVs of diuron (50  $\mu$ M) on a bare GC electrode (a) and on the SMIM electrode (b), showing that the diuron does not produce a peak on the MIP-modified electrode



Figure S5 CVs of propanil (50  $\mu$ M) on a bare GC electrode (a) and on the SMIM electrode (b)



Figure S6 CVs of parathion (5  $\mu M)$  on a bare GC electrode (a) and on the SMIM electrode (b)



Figure S7 CVs of paraoxon (5  $\mu M)$  on a bare GC electrode (a) and on the SMIM electrode (b)