Supporting Information

Fabrication of Fe₃O₄@SiO₂@Ag magnetic-plasmonic nanospindles as highly efficient SERS active substrates for label-free detection of pesticides

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Figure S1. Lateral size distributions of the β-FeOOH (A) and the β-FeOOH@SiO₂ nanospindles (B).
Figure S2. Optical images of the β-FeOOH@SiO$_2$ suspension solution (A-B) and the Fe$_3$O$_4$@SiO$_2$ suspension solution (C-D) without an external magnetic field and in an external magnetic field.

Figure S3. IR spectra of the Fe$_3$O$_4$@SiO$_2$ nanospindles.
Figure S4. SEM images of the Fe₃O₄@SiO₂@Ag nanospindles fabricated at various concentrations of AgNO₃ from (A)10mM, (B)20mM, (C)40mM to (D)80mM.

Figure S5. UV-vis spectra of (a) Fe₃O₄@SiO₂ nanospindles and Fe₃O₄@SiO₂ nanospindles prepared with following concentrations of AgNO₃: (b) 10 mM; (c) 20 mM; (d) 40 mM; (e) 80 mM.

Figure S6. Optical images of the zeta potential of Fe₃O₄@SiO₂ nanospindles in ultrapure water.