Supplementary Information

Dual functional PDMS sponge SERS substrate for the on-site detection of pesticides both on fruit surfaces and in juice

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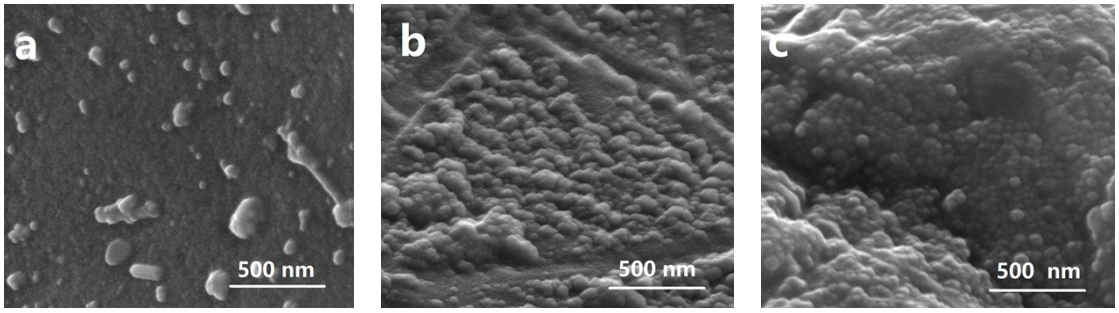

Fig. S1 SEM images of different rounds of Ag NPs deposited on PDMS sponge. a-c represented one, two and three rounds of Ag NPs deposition, respectively.

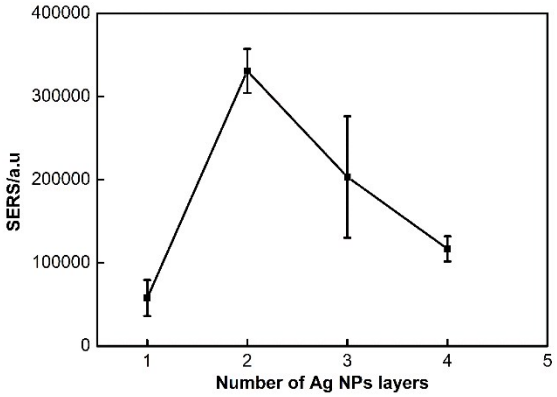

Fig. S2 SERS performance of different Ag NPs rounds-modified PDMS sponge. 20 μL triazophos (50 ppm) was used as the Raman probe. Laser power: 14 mW. Integration time: 50 s. Objective: 50×.

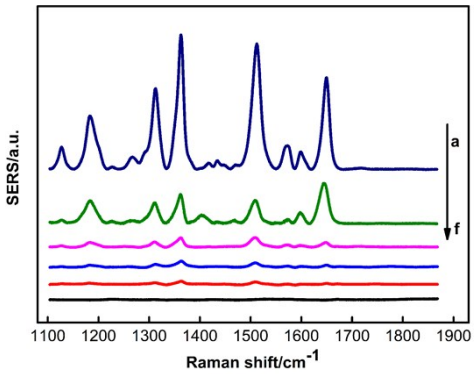

Fig. S3 SERS spectra of R6G on the PDMS sponge-SERS substrate. The concentrations of R6G were: (a-f) 100 nM, 10 nM, 5 nM, 1 nM, 0.1 nM, 0 nM, respectively. Laser power: 10 mW. Integration time: 5 s. Objective: 20×.

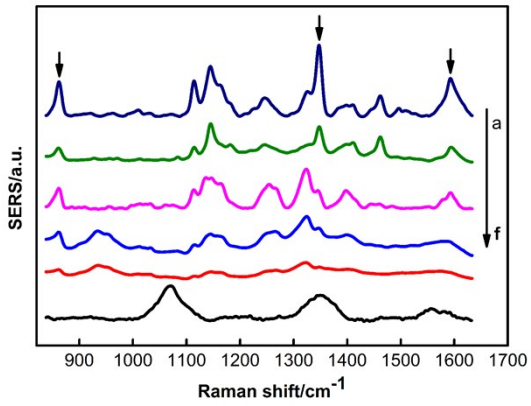

Fig. S4 SERS spectra of methyl parathion from the surface of glass. The concentration of methyl parathion were: (a-f) 50 ppm, 10 ppm, 5 ppm 1 ppm, 0.1 ppm, 0 ppm, respectively. Laser power: 10 mW. Integration time: 50 s. Objective: 20×.

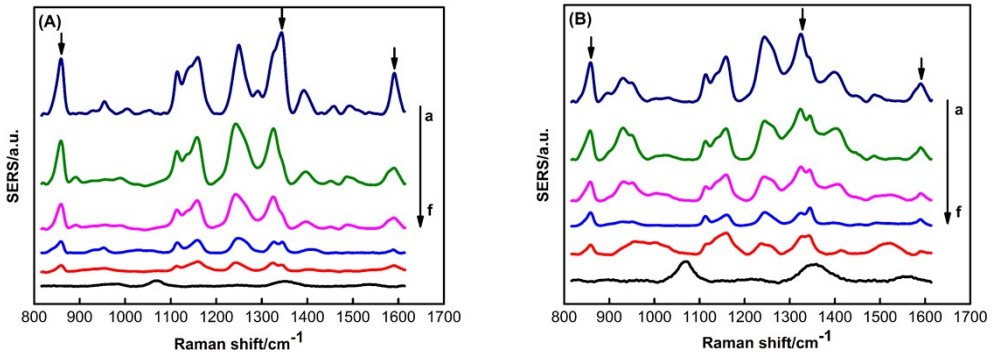

Fig. S5 SERS spectra of methyl parathion from the surface of Cherry tomatoes (A) and Plum (B). The concentrations of methyl parathion were: (a-f) 50 ppm, 10 ppm, 5 ppm, 1 ppm, 0.1 ppm, 0 ppm, respectively. Laser power: 10 mW. Integration time: 50 s. Objective: 20×.

Samples were analyzed by HPLC on LiChrospher®100 RP 18 column and UV-detector. Methanol and water were used as mobile phase, at a flow rate of 0.8 mL/min with 15 min and detection at 254 nm. The gradient elution profile of methanol and water was programmed as methanol/water = 70:30 (v/v). The

column oven was set at 28 ℃, and the injection volume was 20 μL. The found value of the pesticides in the sponge SERS substrate was then plugged into equation 3 to determine the sampling efficiency.

100 ppm triazophos was prepared by using methanol as solvent, then this solution was diluted to 10 ppm, 5 ppm, 2.5 ppm, 1ppm, 0.5ppm, 0.1 ppm. These samples were used for the construction of calibration curve.

The standard curve for HPLC in Fig. S6 showed that, the fitting equation is $y = ax + b$, (a = 236214, b = 36373, R^2 = 999). The data of the three parallel tests were averaged, and the absolute amount of triazophos from Cherry Tomatoes and Plum obtained by sticking to the HPLC standard curve.

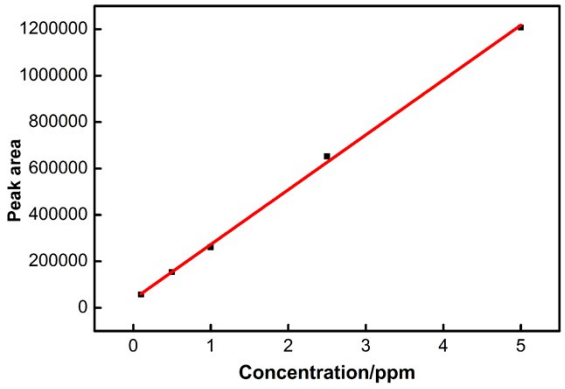

Fig. S6 HPLC operating curves for different concentrations of triazophos used for recovery detection.

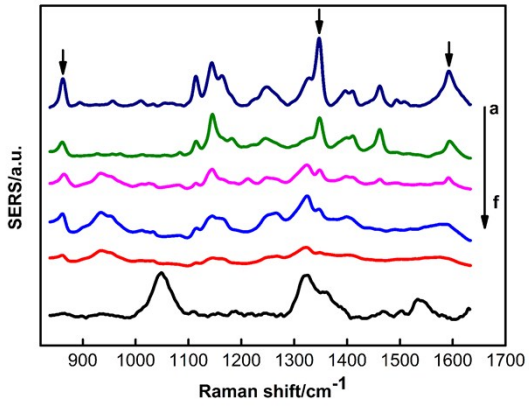

Fig. S7 SERS spectra of methyl parathion in carrot juice. The concentrations of methyl parathion were: (a-f) 100 ppm, 50 ppm, 10 ppm, 5 ppm, 1 ppm, 0 ppm, respectively. Laser power: 10 mW. Integration time: 50 s. Objective: 20×.