

Supporting Information

Fig. S1 SERS Spectral curve of 0.3mM thiram on apple surface enhanced by Au@Ag NRs. Red curve is a pristine spectrum while blue curve is the filtered spectrum after Fast Fourier Transform and Bandpass filter background pretreatment.



Fig. S 2 (a) Concentration-dependent SERS spectra and (b) dose-response curve of thiram using Au@Ag NRs as substrate. Inset is the partial enlargement of data points from 1.3×10⁻⁶M to blank on horizontal axis. (The LOD of thiram in Au@Ag NRs is ~1.5×10⁻⁷M)

Fig. S 3 (a) Concentration-dependent SERS spectra and (b) dose-response curve (at 675 cm⁻¹) of methamidophos (MTD) using Au@Ag NRs as substrate. Inset is the partial enlargement of data points from 1.1×10⁻⁴M to blank on horizontal axis. (The LOD of MTD in Au@Ag NRs is ~6.8×10⁻⁶M)

Fig. S 4 (a) Concentration-dependent SERS spectra and (b) dose-response curve of thiram using GNRs as substrate. Inset is the partial enlargement of data points from 1.3×10^{-6} M to blank on horizontal axis. (The LOD of thiram in GNRs is ~4.6×10⁻⁷M)

Fig. S 5 (a) Concentration-dependent SERS spectra and (b) dose-response curve (at 675 cm⁻¹) of methamidophos (MTD) using GNRs as substrate. (The LOD of MTD in GNRs is ~8.8×10⁻⁴M)

Fig. S 6 (a) Concentration-dependent SERS spectra and (b) dose-response curve of thiram on apple peels using GNRs as substrate. Inset is the partial enlargement of data points from 4×10^{-6} M to blank on the horizontal axis. (The LOD of thiram on apple by enhancement of GNRs is 1.2×10^{-5} M).