Electronic Supplementary Material (ESI) for Analytical Methods.

Label-Free and ultrasensitive SERS detection of pesticide residue using 3D hot-junction of Raman enhancing montmorillonite/silver nanoparticles nanocomposite

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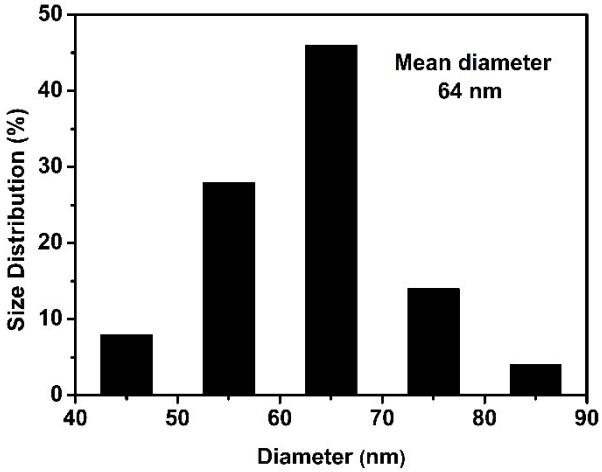

Fig. S1 Histogram of the AgNPs size distribution.

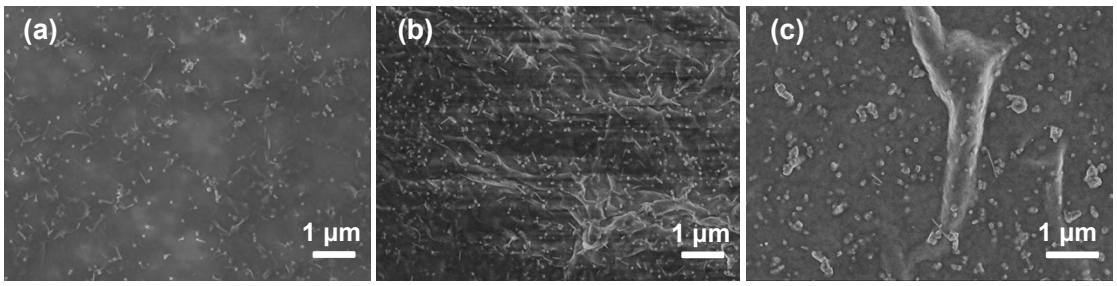

Fig. S2 SEM images of MMT/AgNPs nanocomposite with different volume ratio of MMT and AgNPs: (a) 1:7, (b) 1:10 and (c) 1:20.

Table S1 The SERS vibrational band assignments of thiram

Peak position (cm^{-1})	Assignment
561	S–S stretching
931	C=S and CH_3N stretching
1143	CN stretching, CH_3 rocking
1378	CN stretching, symmetric CH_3 deformation
1505	CN stretching vibration, CH_3 deformation, CH_3 rocking

Table S2 Comparison of the proposed approach with reported methods for the detection of thiram.

Method	Limit of detection	Detection range	R^2	Ref.
Fluorescence	0.1 μg/mL	0.5-2.5 μg /mL	0.9993	1
Fluorescence	70 nM	0.5-1000 μM	0.9926	2
Phosphorescenc	25.0 nM	0.05–2.5 μM	-	3
Colorimetric	0.036 μM	0.1- 100 μM	0.95/0.99	4
Colorimetric	19.7 nM	0.025-0.35 μM	0.99345	5
Electrochemical	0.7×10^{-6} M	-	0.99	6
HPLC	0.22 μg/mL	0.07-15 μg/mL	0.9905	7
Raman	10^{-7} M	1.0×10^{-7}-1.0×10^{-3} M	0.9978	8
Raman	50 ng/g	0.1−12 μg/g	0.9950	9
Raman	1.0×10^{-8} M	1.0×10^{-8}-1.0×10^{-3} M	0.9927	This work

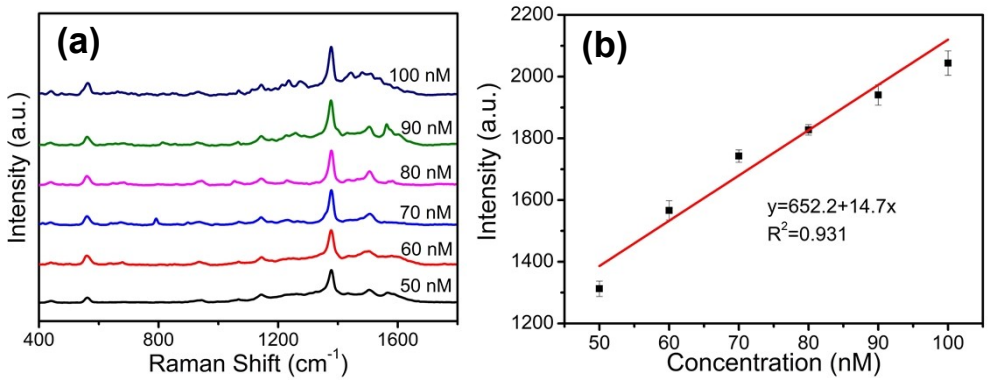

Fig. S3 (a) SERS detection of thiram on the apple. (b) The averaged peak intensities of the 1378 cm^{-1} as a function of the concentration of thiram on the apple.

References

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