Electronic Supplementary Material (ESI) for Analytical Methods.

In situ SERS detection of multi-class insecticides on plant surfaces

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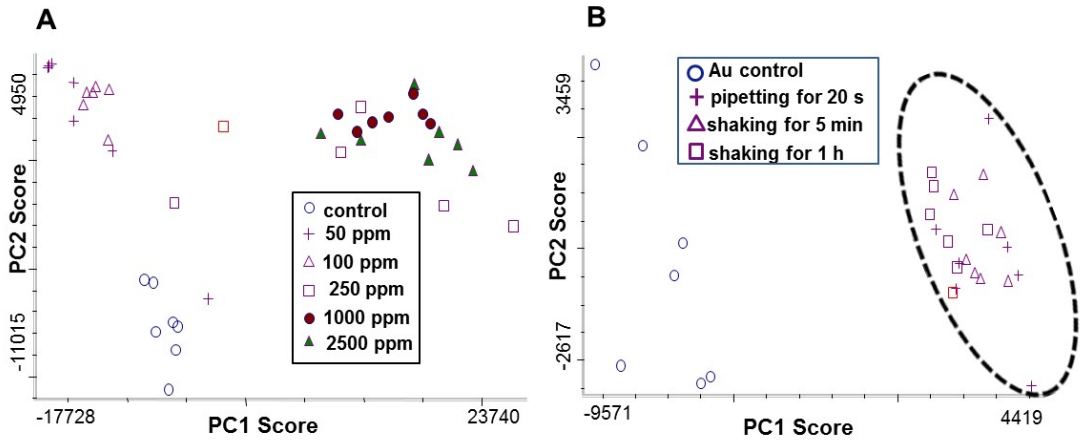


Figure S1. PCA analysis of Au NPs with isocarbphos. A. different Au NPs concentration (50-2500 ppm) with 10 ppm of isocarbphos B. different incubation method

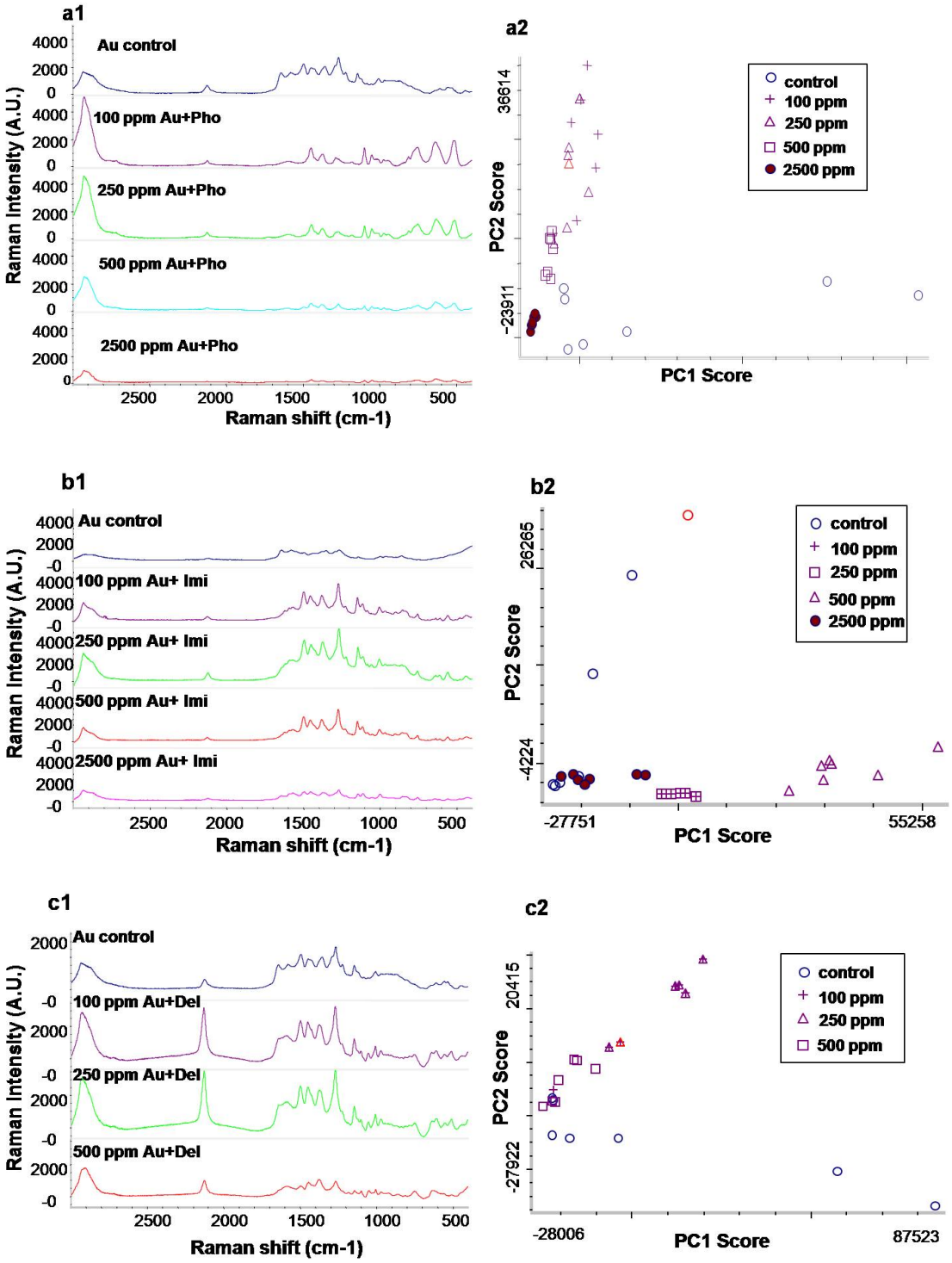


Fig. S2 Different Au NPs concentration was combined with targets. a, phorate; b, imidacloprid; c, detlamethrin (1.Raman spectrum; 2. PCA plots)

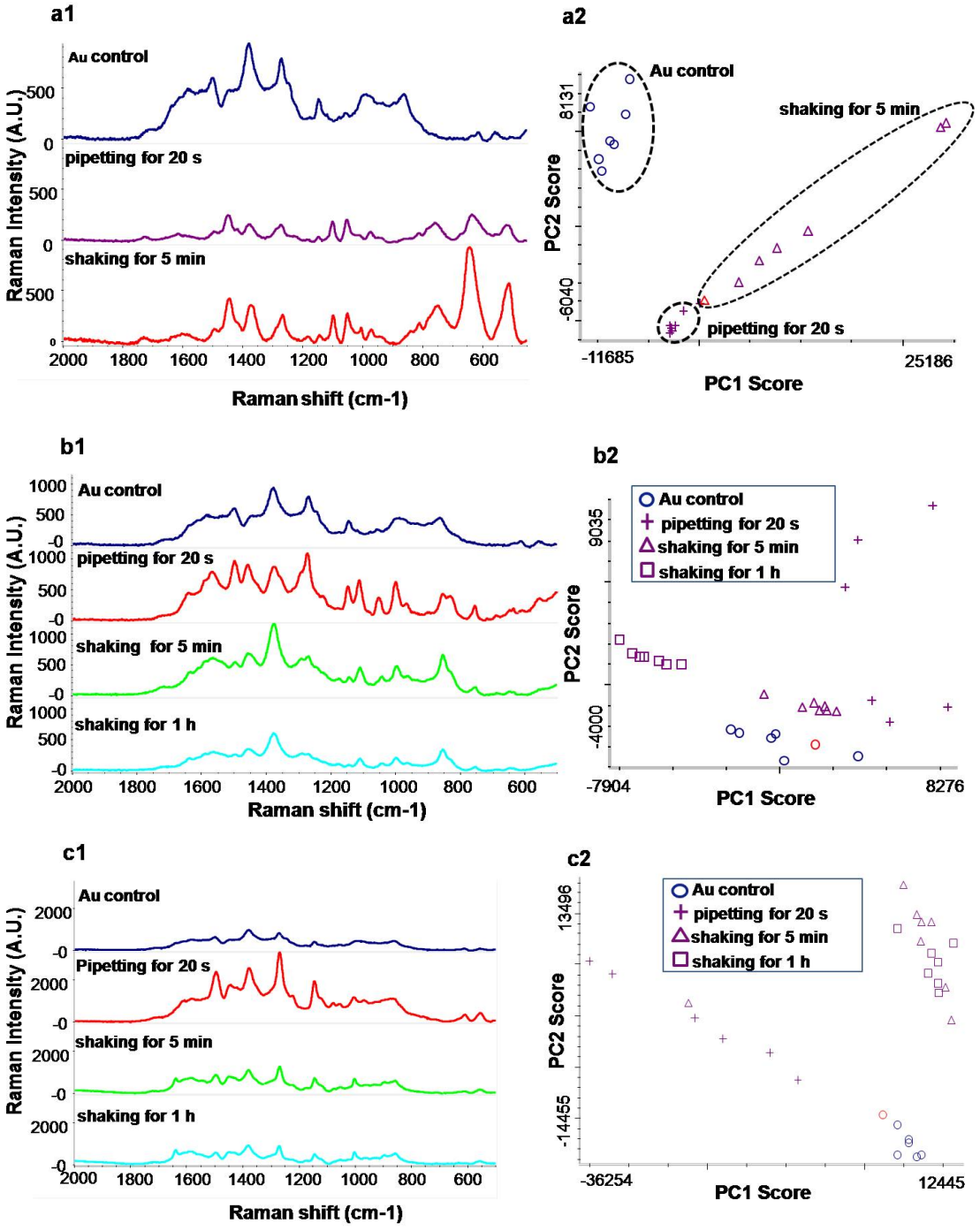


Fig. S3 Different incubation method and time of Au NPs and targets. a, phorate; b, imidacloprid; c, detlamethrin (1.Raman spectrum; 2. PCA plots)

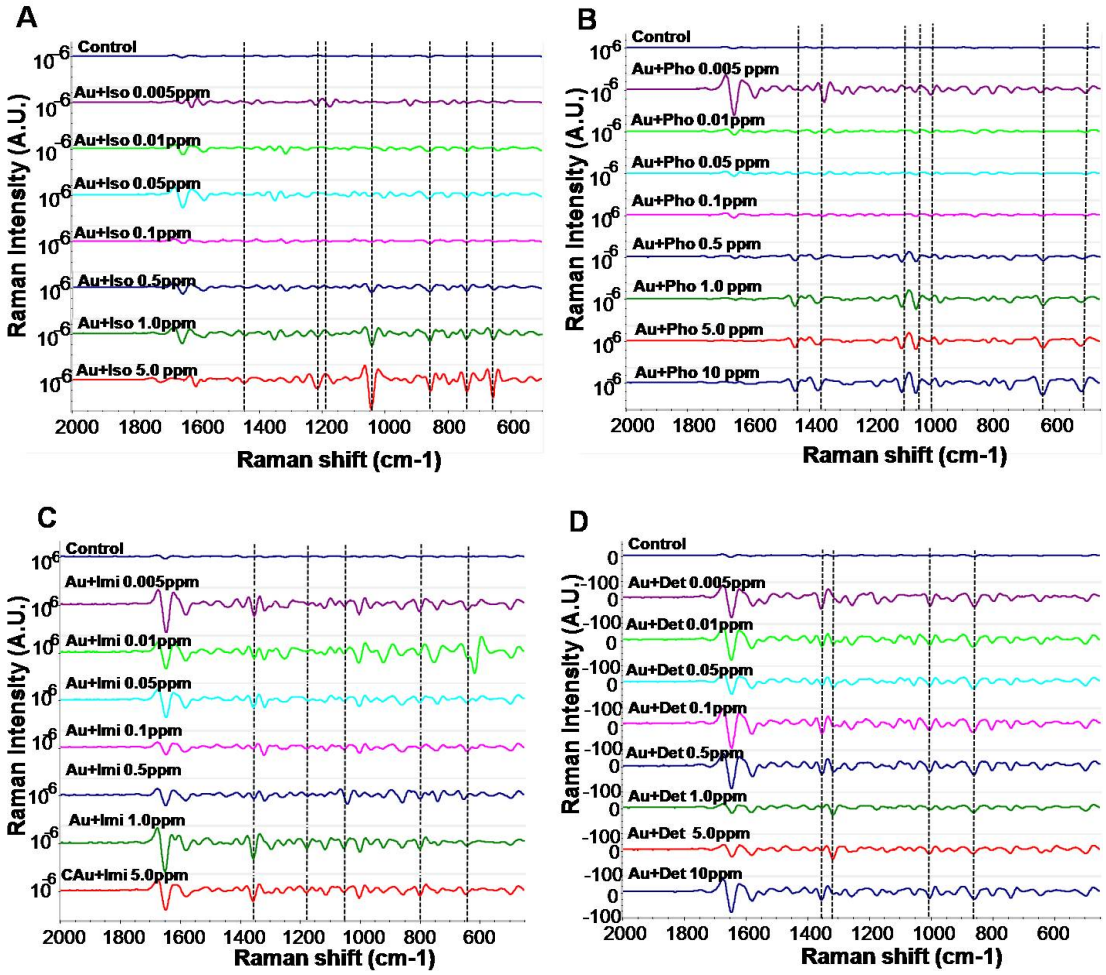
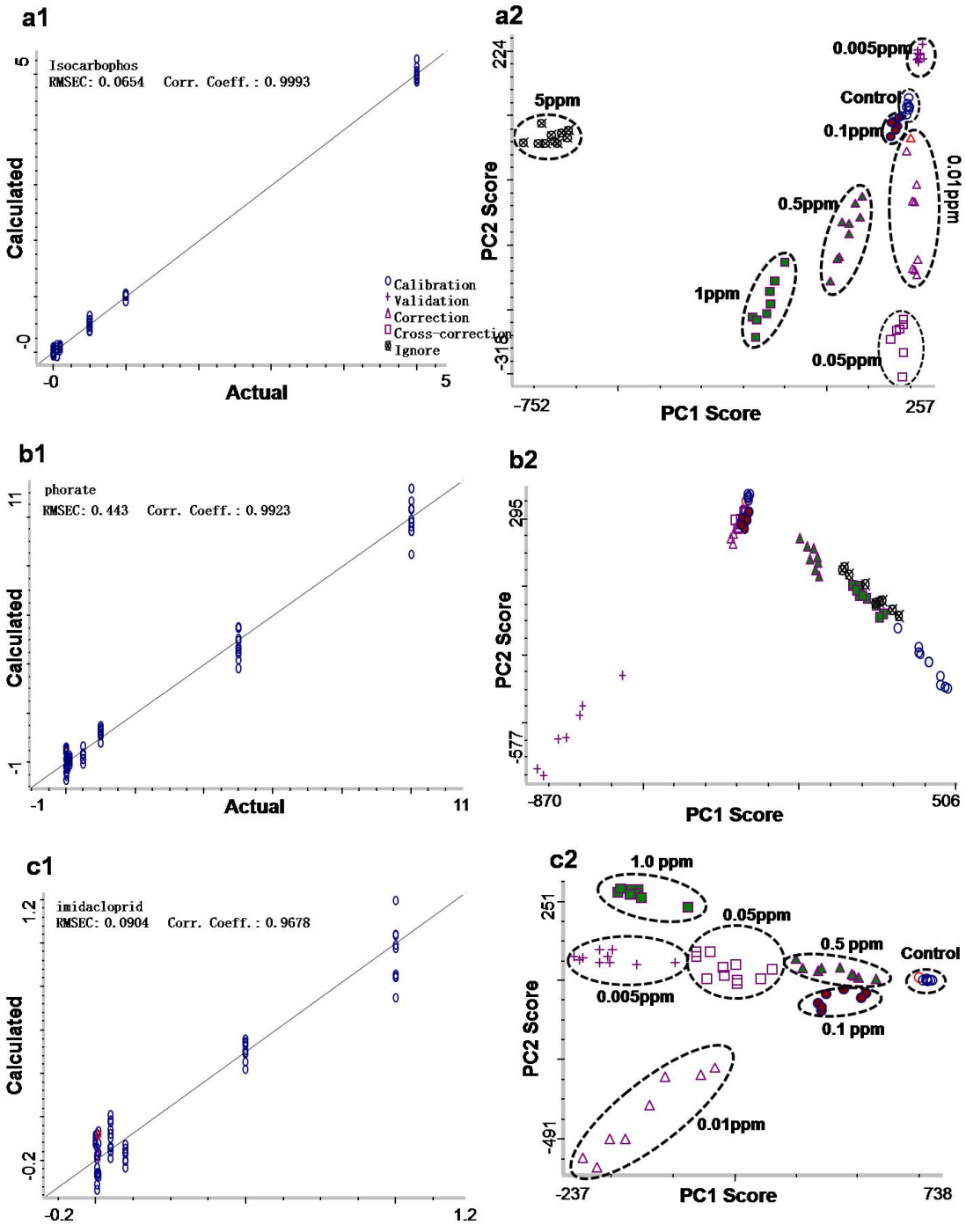


Fig. S4 Identified peaks and Second derivative Raman spectra of different concentration for four insecticides. A, identified peaks (a1, Iso; a2, Pho; a3, Imi; a4, Det); B, Second derivative Raman spectra (b1, Iso; b2, Pho; b3,Imi; b4, Det)


a1
Isocarbophos
RMSEC: 0.0654 Corr. Coeff.: 0.9993
Calculated
Actual
Calibration
Validation
Correction
Cross-correction
Ignore
a2
5ppm
0.005ppm
Control
0.1ppm
0.5ppm
1ppm
0.01ppm
0.05ppm
PC2 Score
PC1 Score
b1
phorate
RMSEC: 0.443 Corr. Coeff.: 0.9923
Calculated
Actual
b2
PC2 Score
PC1 Score
c1
imidacloprid
RMSEC: 0.0904 Corr. Coeff.: 0.9678
Calculated
c2
1.0 ppm
0.05ppm
0.5 ppm
Control
0.005ppm
0.1 ppm
0.01ppm
PC2 Score
PC1 Score

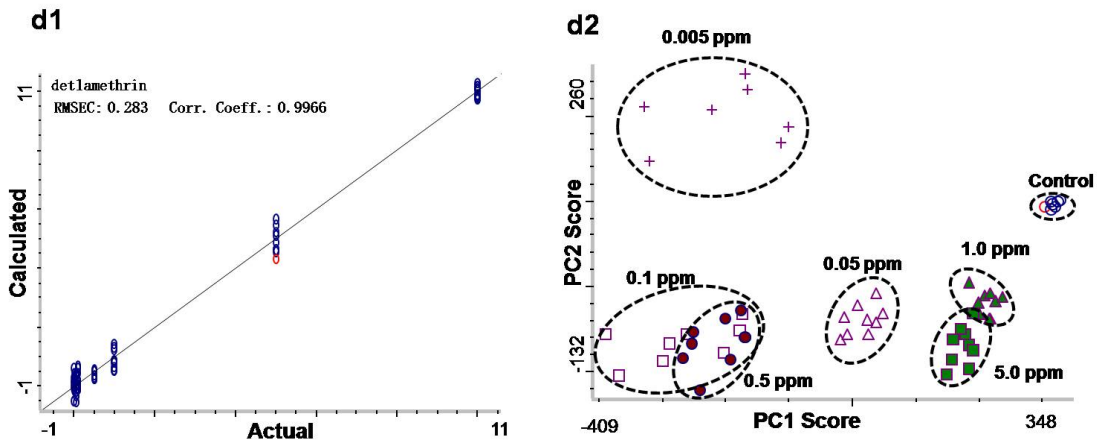


Fig. S5 PLS and PCA plots of four insecticides (a, Iso;b, Pho; c,Imi; d, Det)

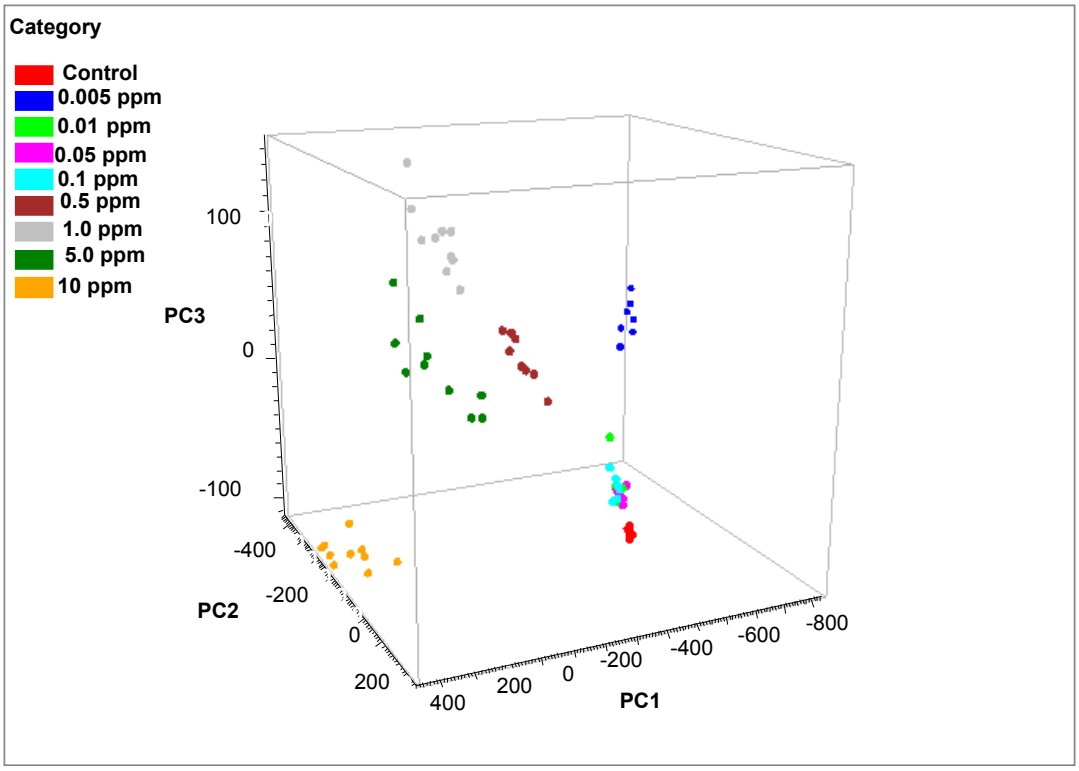


Fig. S5-b2-1 3D figure for phorate.

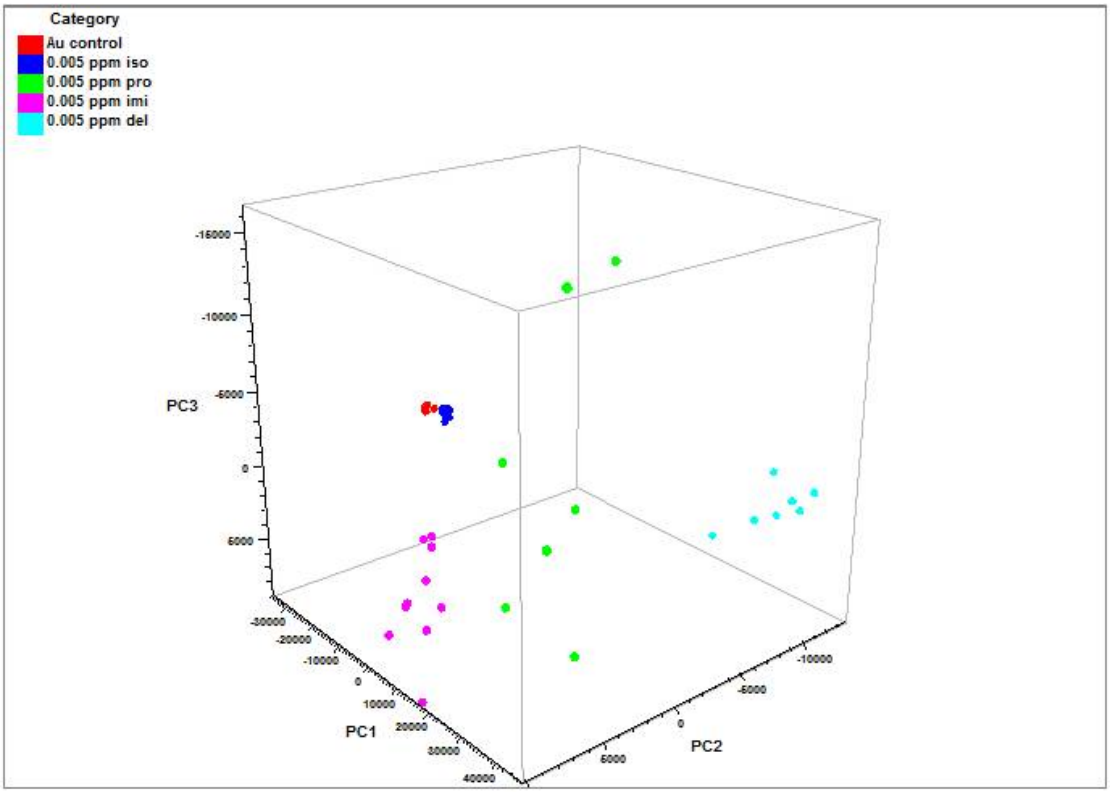


Fig. S6 LOD of four insecticides with PCA (0.005 ppm showed using 3D Figure)

Fig. S7 Optical images of selected scan point. A, tea leaf no Au NPs; B, tea leaf was dropped Au NPs and then mixed; C, exposed-insecticide tea leaf was dropped with Au NPs and mixed.

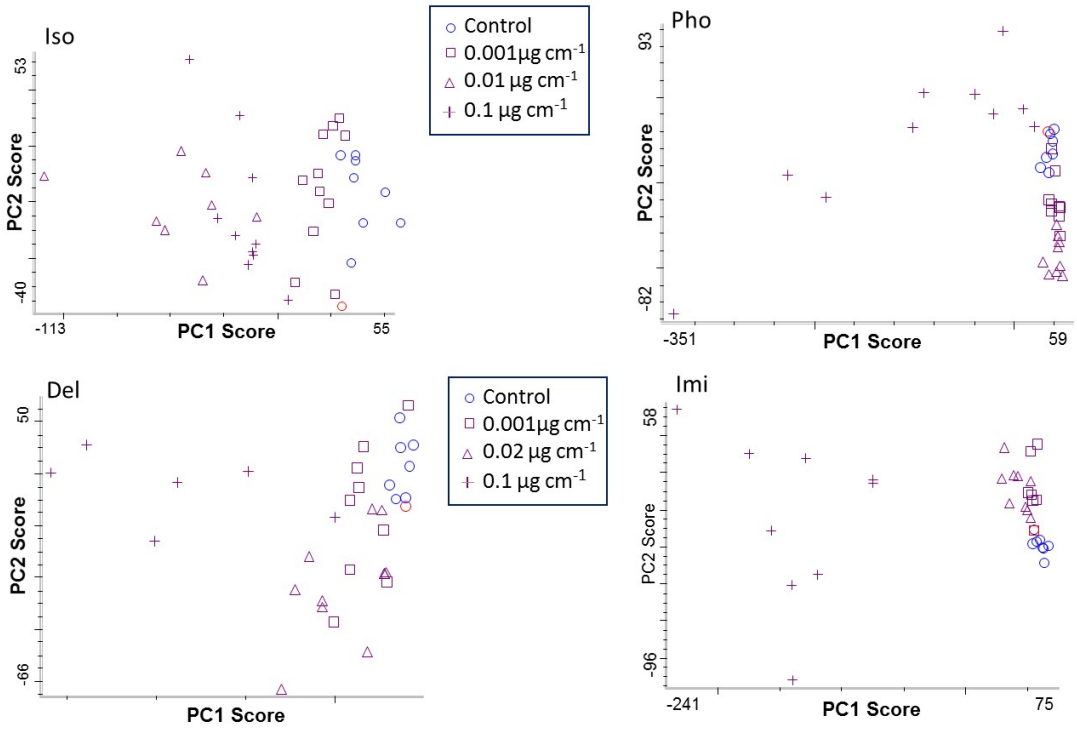


Fig. S8 LOD of four insecticides on tea leaf with PCA