Supplementary Material

Sensitive determination of thiram in apple samples using ZIF-67 modified Si/Au@Ag composite as SERS substrate

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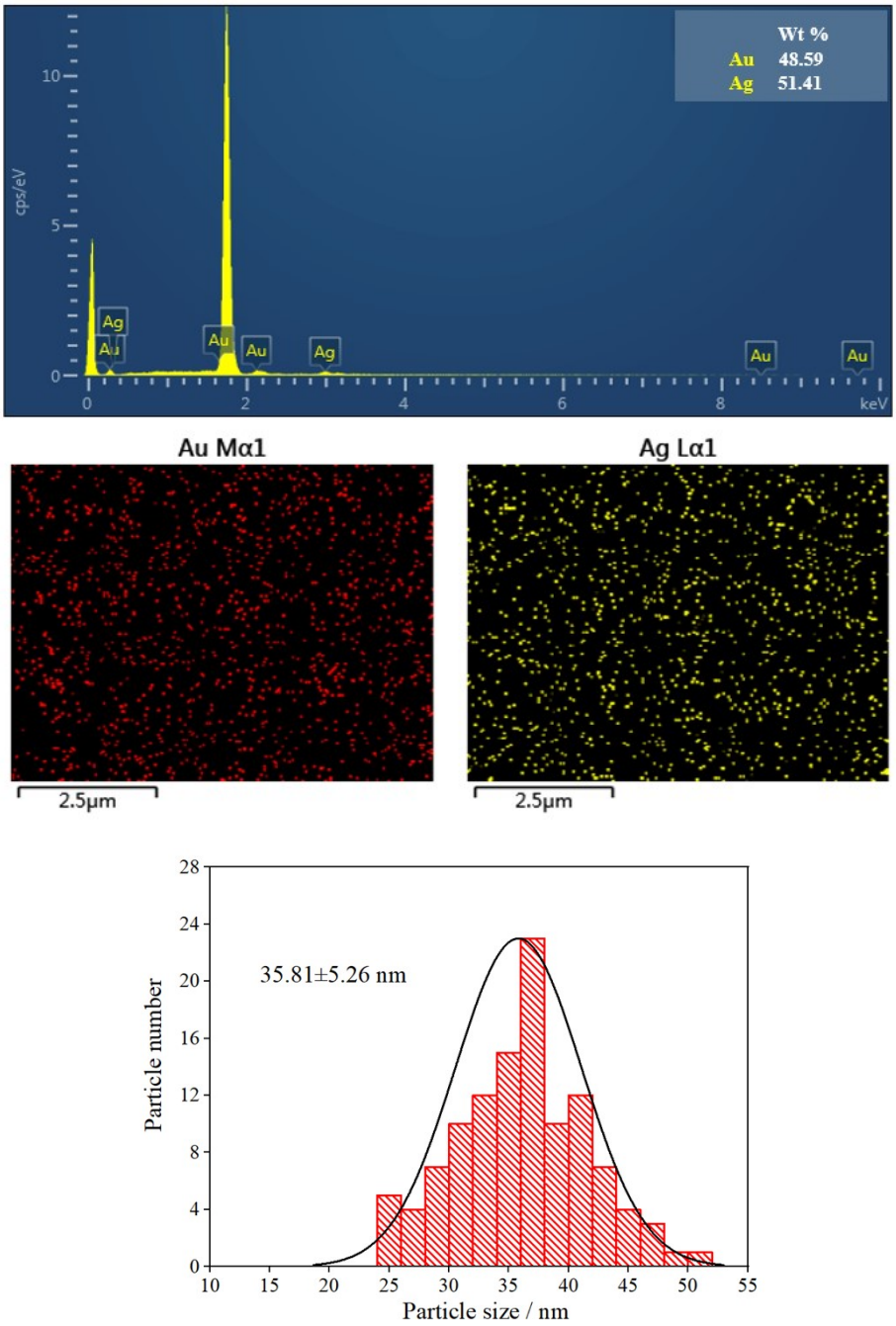

Figure S1. EDS spectrum, elemental mapping and the size distribution images of Si/Au@Ag.

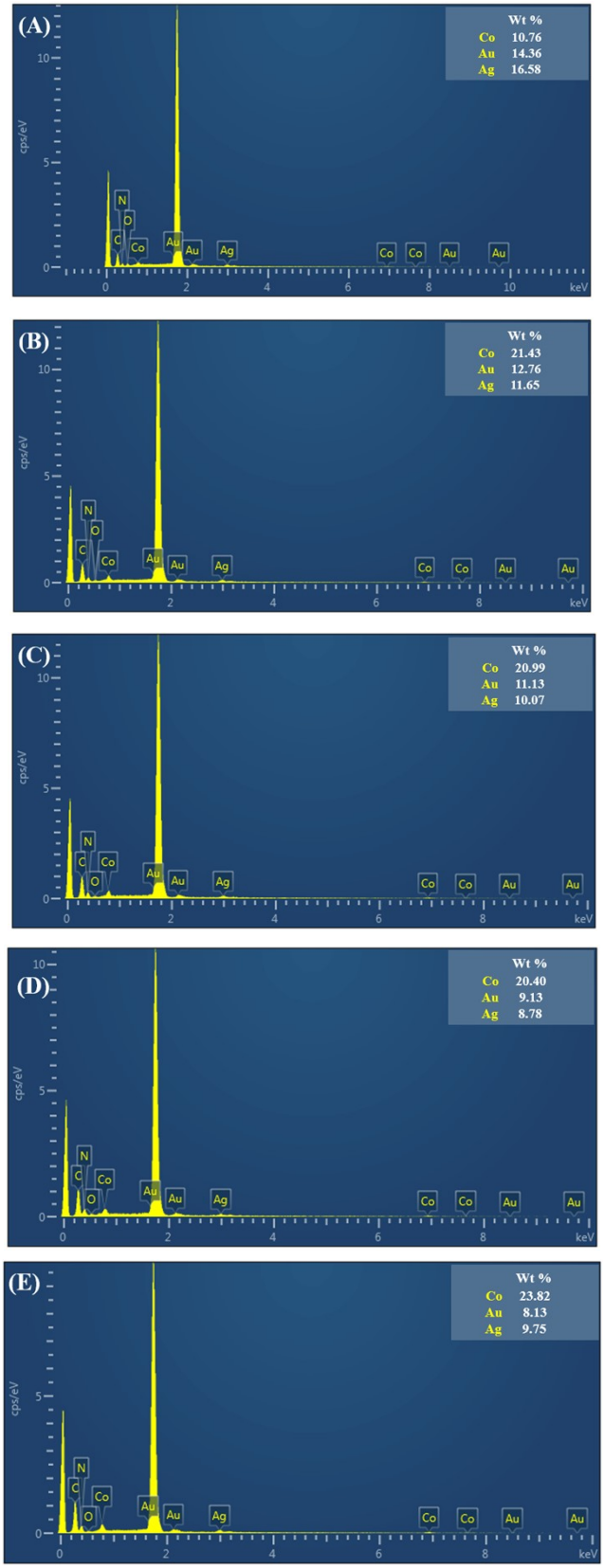

Figure S2. EDS spectra of various Si/Au@Ag/ZIF-67 substrates prepared with immersion times of (A) 10 min, (B) 20 min, (C)30 min, (D) 40 min and (E) 60 min.

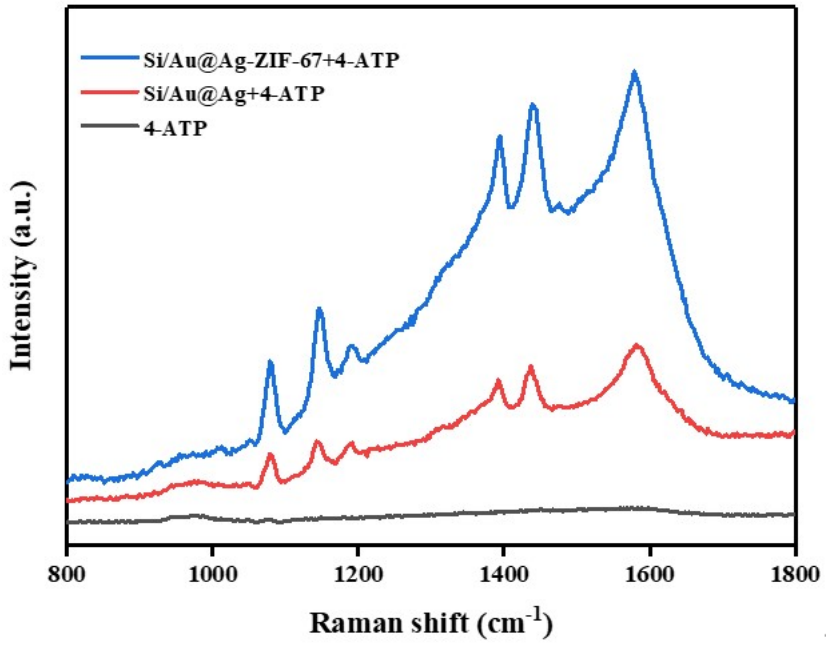

Figure S3. SERS spectra of 4-ATP exposed on Si/Au@Ag and Si/Au@Ag/ZIF-67 substrates.

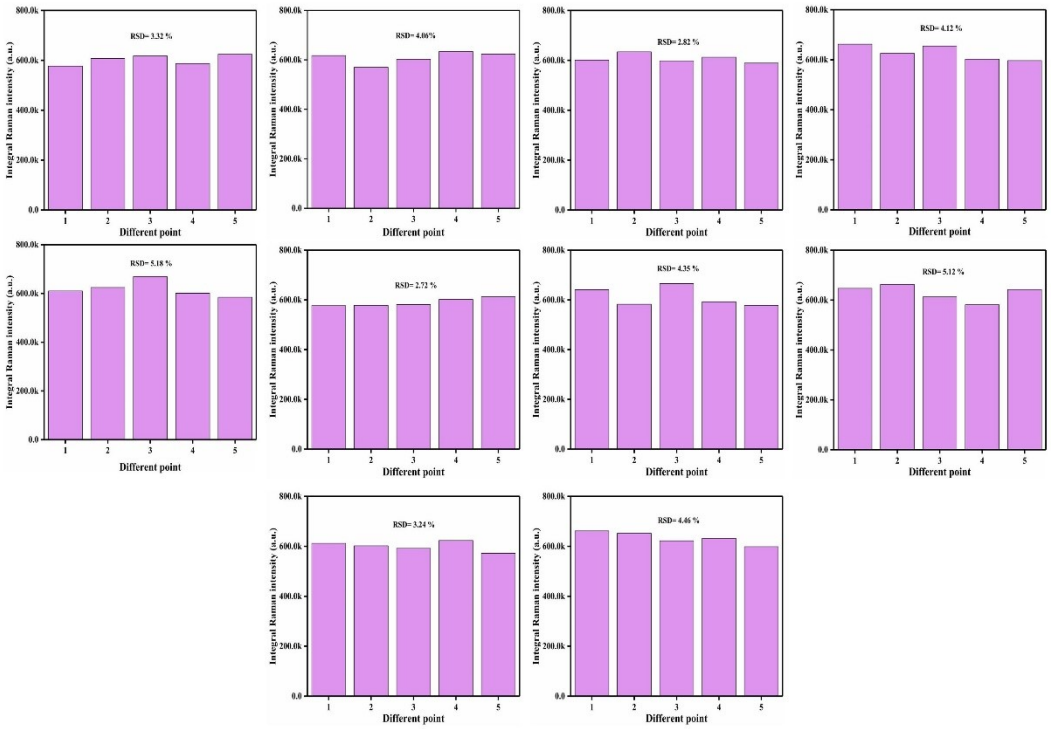

Figure S4. Integral Raman intensities of ten SERS substrates in contact with 1 mM 4-ATP. Five points were detected on each substrate.

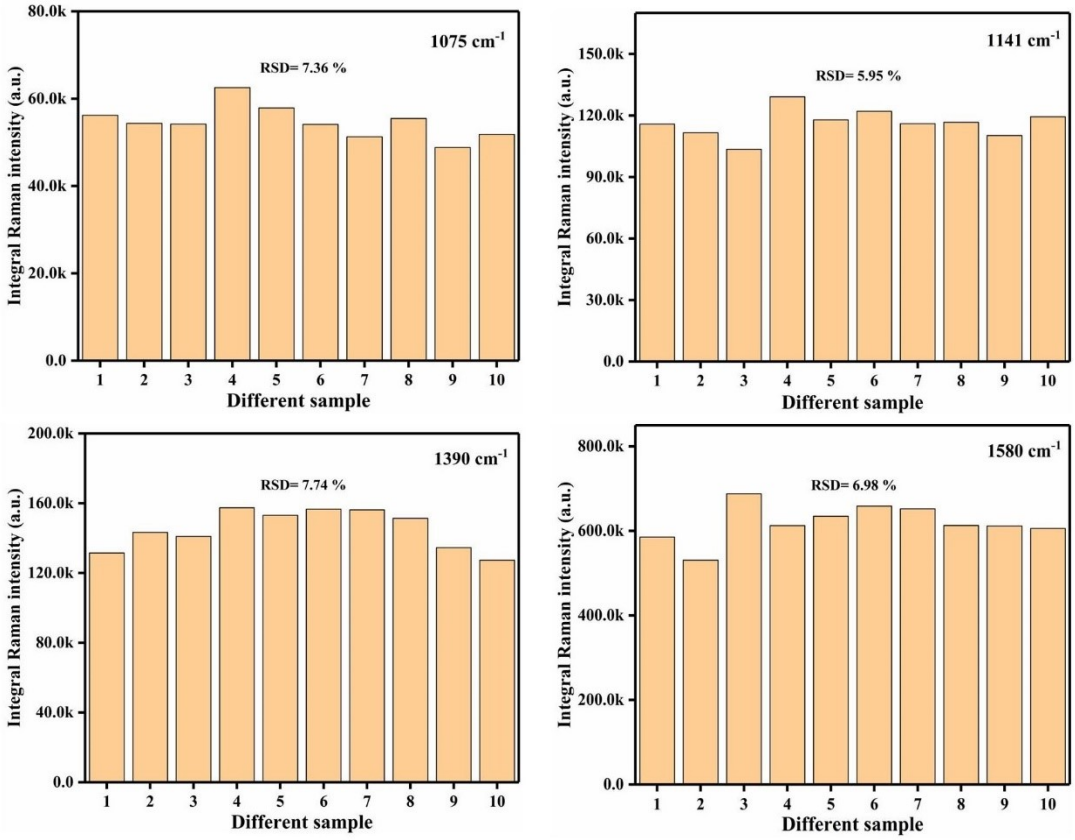

Figure S5. Intensities of the Raman peaks of 4-ATP at 1075, 1141, 1390 and 1580 cm^{-1} in 10 different sample.