

Figure S1. The transmission electron microscopy (TEM) images of AuNPs with different heating reaction time: (a) 10 min; (b) 15 min; (c) 20 min; (d) 30 min.



Figure S2. The dispersibility of AuNPs with different heating reaction time: (a) 10 min; (b) 15 min; (c) 20 min; (d) 30 min.



Figure S3. the UV–vis spectrometry of AuNPs with different heating reaction time: (a) 10 min; (b) 15 min; (c) 20 min; (d) 30 min.



Figure S4. (a) The RS simulation based on DFT calculation; (b) the RS of DM powder; (c) the RS simulation based on DFT calculation; (d) the RS of CBF powder.



Figure S5. The RS of DM residues in soil: (a) the original SERS spectra of 83 samples; (b) the SERS spectra of 83 samples after baseline correction.



Figure S6. The RS of CBF residues in soil: (a) the original SERS spectra of 83 samples; (b) the SERS spectra of 83 samples after baseline correction.