Supporting Information

Citrate-capped gold nanoparticle SERS platforms for ultrasensitive detection of cypermethrin

Peifang Wang, [a] Zhimin Yang, [a] Weixiang Tao, [a] Chongchong Liu [a] and Gang Zhou *[a]

a. *Key Laboratory of Integrated Regulation and Resource Development on Shallow Lake of Ministry of Education, College of Environment, Hohai University, Nanjing 210098, China.*

Email: gangzhou@hhu.edu.cn

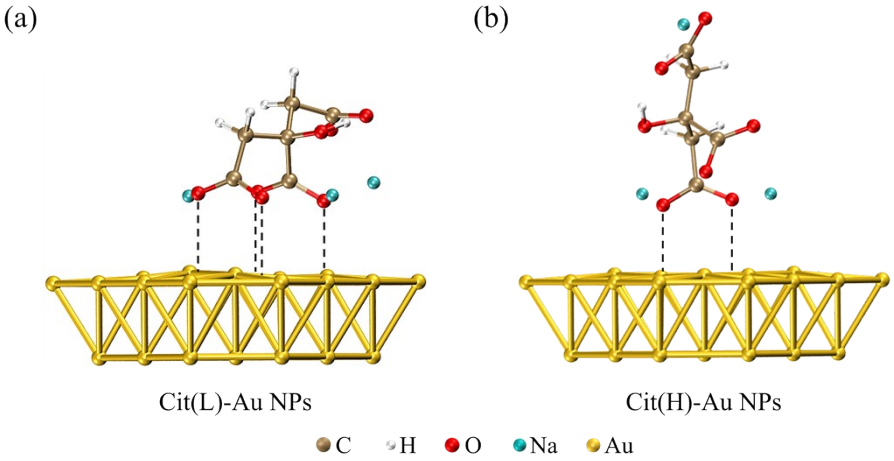

Figure S1 Schematic illustration of two binding modes of sodium citrate on the surface of gold nanoparticles. (a) Bridge binding mode of cit(L)-Au NPs. (b) Monocarboxylate binding mode of cit(H)-Au NPs.

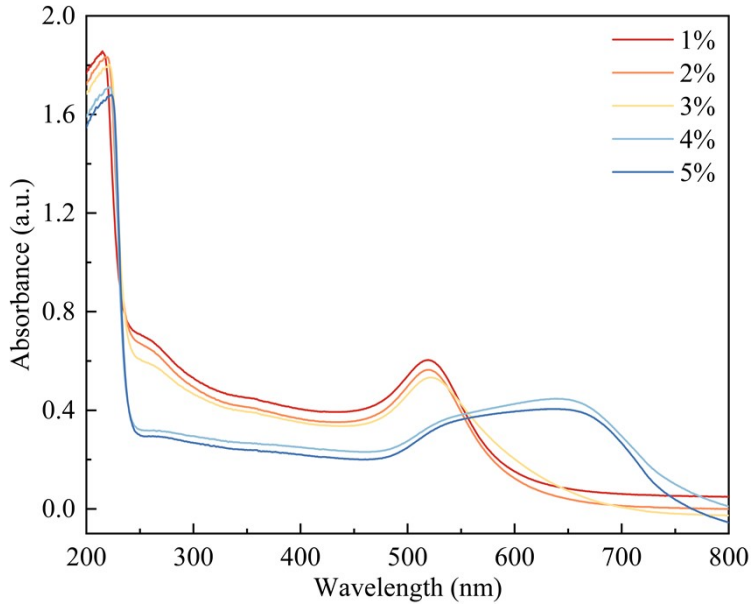

Figure S2 UV-vis absorption spectra of cit(H)-Au NPs prepared with varying concentrations (1–5%) of additional sodium citrate.

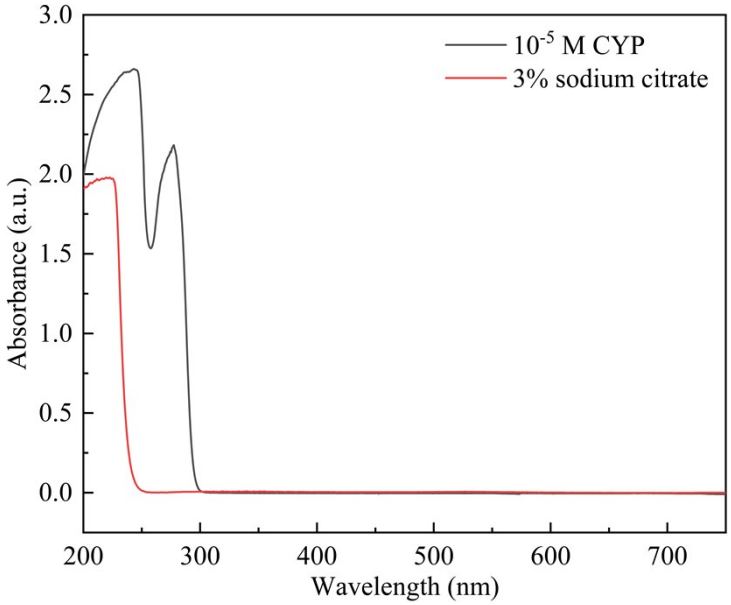

Figure S3 UV-vis absorption spectra of cypermethrin (CYP, 10^{-5} M) and sodium citrate (3%).

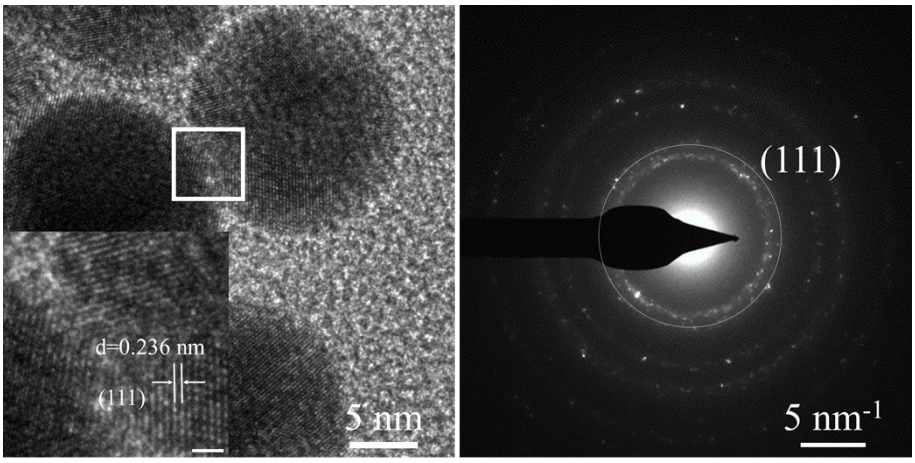

Figure S4 HR-TEM images of the connection of sample of cit(H)-Au NPs with CYP, and the electron diffraction (SAED) pattern of the selected region.

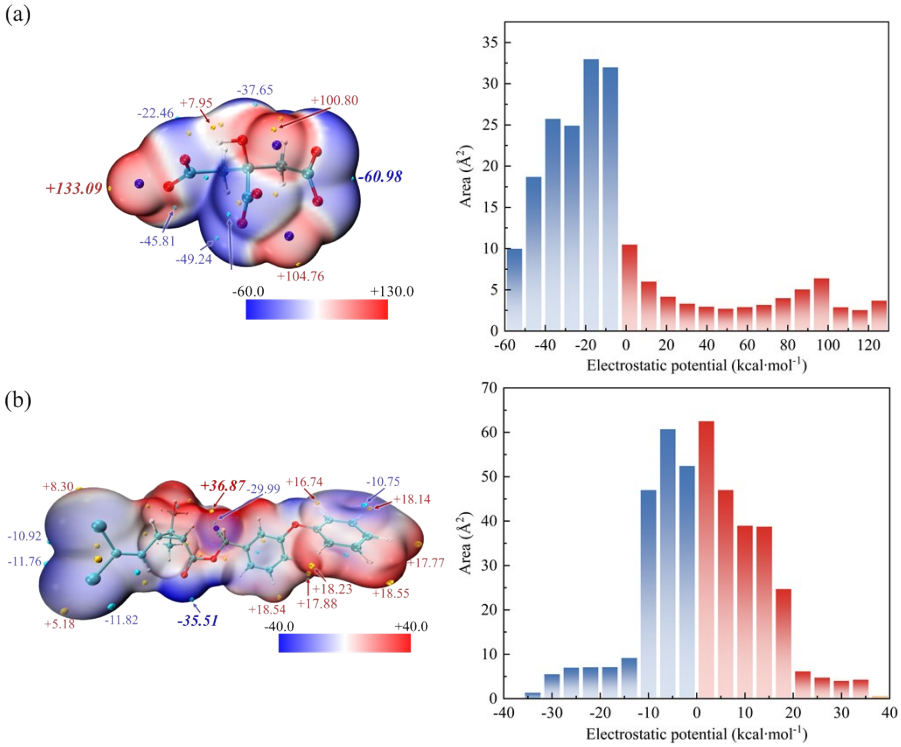

Figure S5 Surface electrostatic potential (ESP) map of sodium citrate and CYP (left), and the corresponding quantitative distribution of electrostatic potential (right). Significant surface local minima and maxima of ESP are represented as cyan and yellow spheres, and labelled by blue and red texts, respectively. The unit is in kcal·mol^{-1}. Only the global minima and maxima on the surface are labelled by italic font.

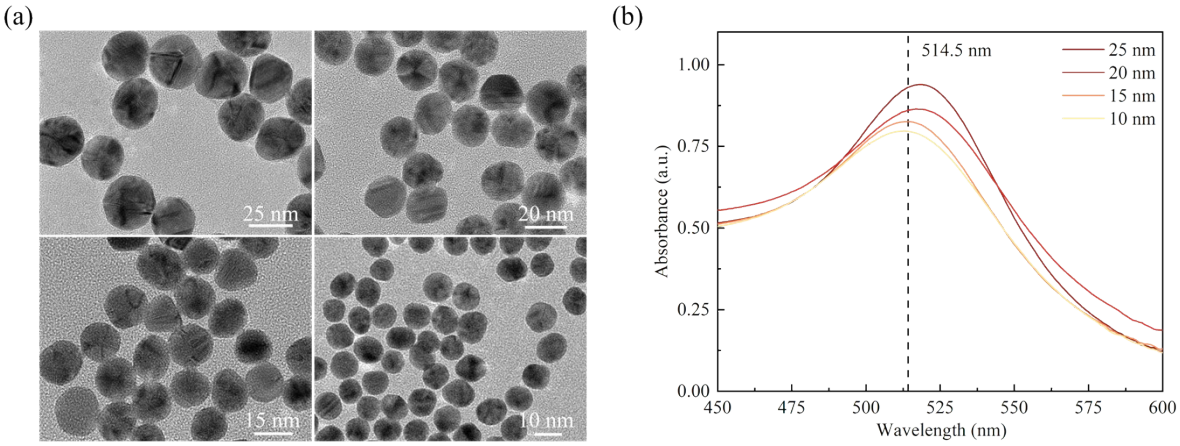

Figure S6 (a) TEM images and (b) UV-vis absorption spectra of cit(H)-Au NPs with different particle sizes (25 nm, 20 nm, 15 nm, 10 nm).

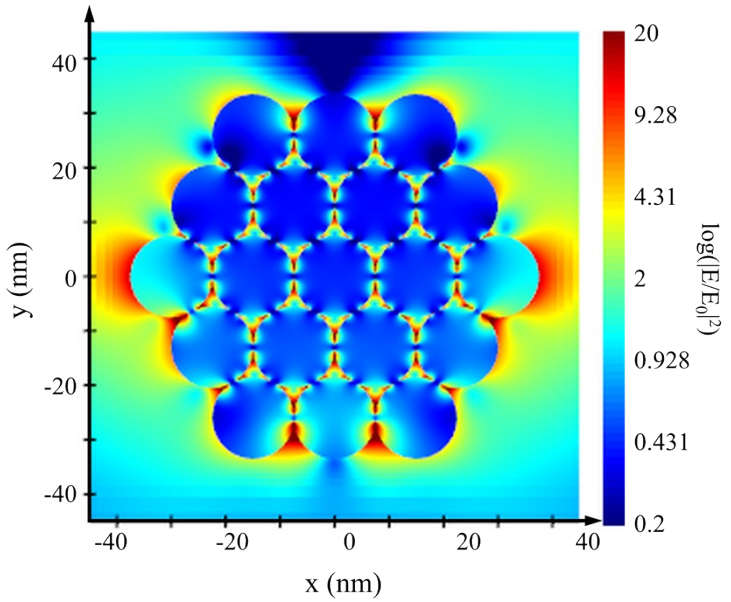

Figure S7 3D-FDTD numerical simulation of cit(H)-Au NPs polymers.

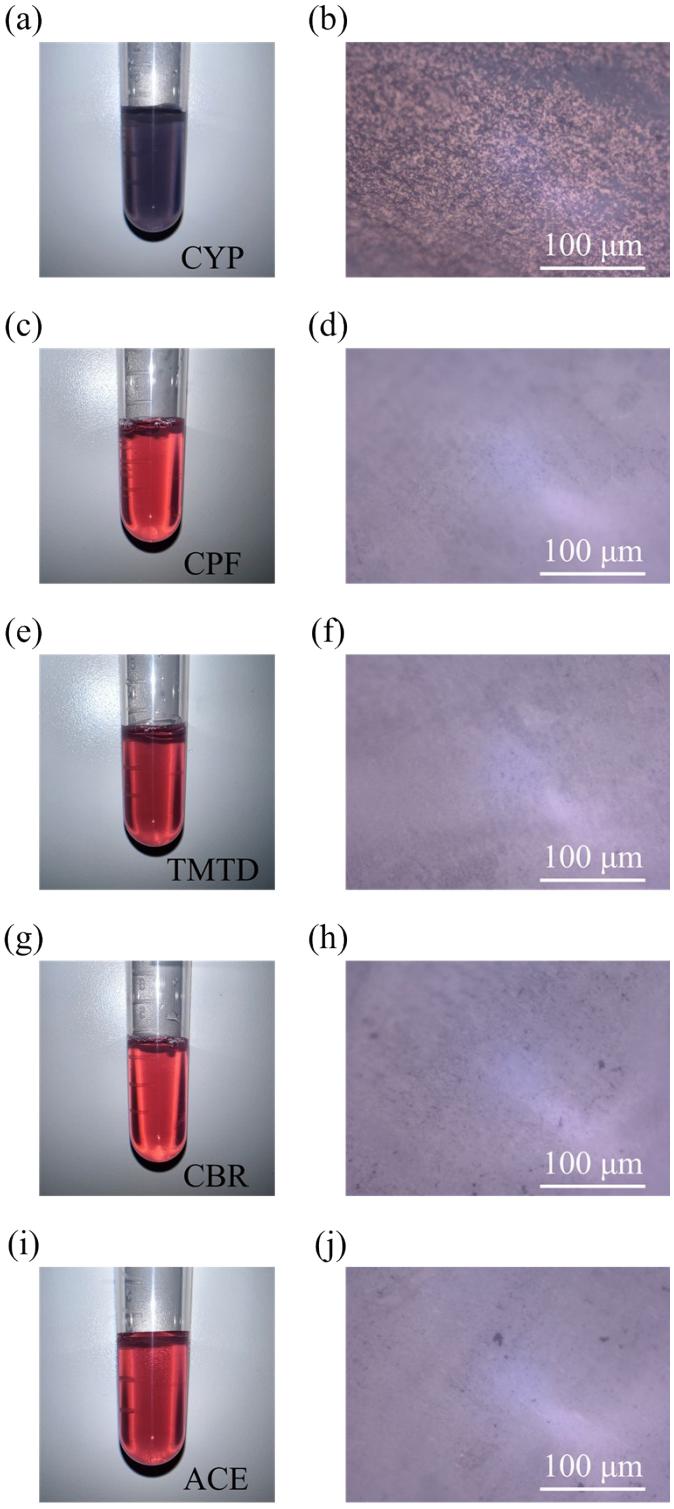

Figure S8 Optical photographs of the cit(H)-Au NPs solution (a) mixed with five pesticides (including CYP) and the filter membrane substrate (b). Optical photographs of the solutions (c, e, g, i) and corresponding filter substrates (d, f, h, j) after mixing cit(H)-Au NPs with four other pesticides (CPF, TMTD, CBR, ACE, excluding CYP). The concentration of all pesticides was 1×10^{-5} M.