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SUPPORTING INFORMATION

CONTROLLED SYNTHESIS OF SPINOUS GOLD NANOPARTICLES AND USE FOR SURFACE-ENHANCED RAMAN SCATTERING (SERS) DETECTION OF ANTIBIOTIC SULFATHIAZOLE

Khuong Quoc Vo*[a, b], Man Van Tran*[a, b, c], Thu Anh Nguyen[a, b], Thi Cao Anh Tran[a, b], Sy Van Vu[a, b], Kha Ni Tran[d], Nguyen Thanh Si[d], Pham Vu Nhat[d].

Faculty of Chemistry, University of Science, Vietnam National University Ho Chi Minh City, 227 Nguyen Van Cu Street, Ward 4, District 5, Ho Chi Minh City 70000, Vietnam.
Vietnam National University, Ho Chi Minh City, Vietnam
Applied Physical Chemistry Laboratory, University of Science, Vietnam National University Ho Chi Minh City, 227 Nguyen Van Cu Street, Ward 4, District 5, Ho Chi Minh City 70000, Vietnam.
Department of Chemistry, Can Tho University, Can Tho City, 900000, Vietnam.
* Corresponding authors

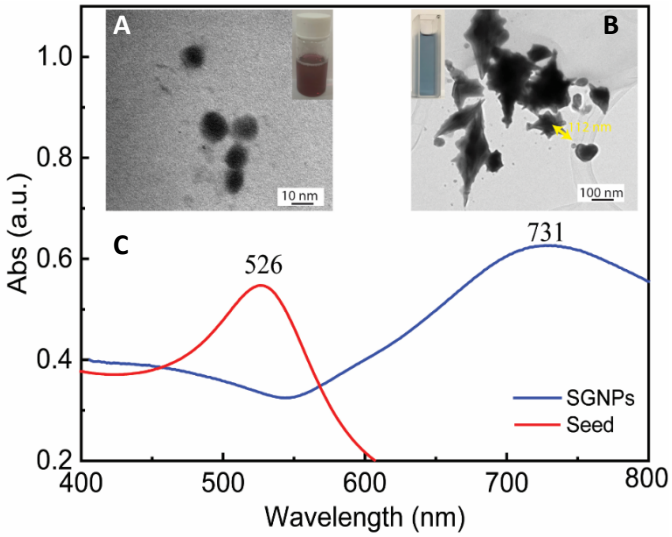

Fig. S1 The TEM images of (A) seed nanoparticles with the corresponding SGNPs colloidal solution (right inset) (scale bar 10 nm), (B) the formed SGNPs with corresponding blue colloid (left inset) (scale bar 100 nm), (C) UV-Vis spectroscopy of seed and SGNPs colloidal solutions

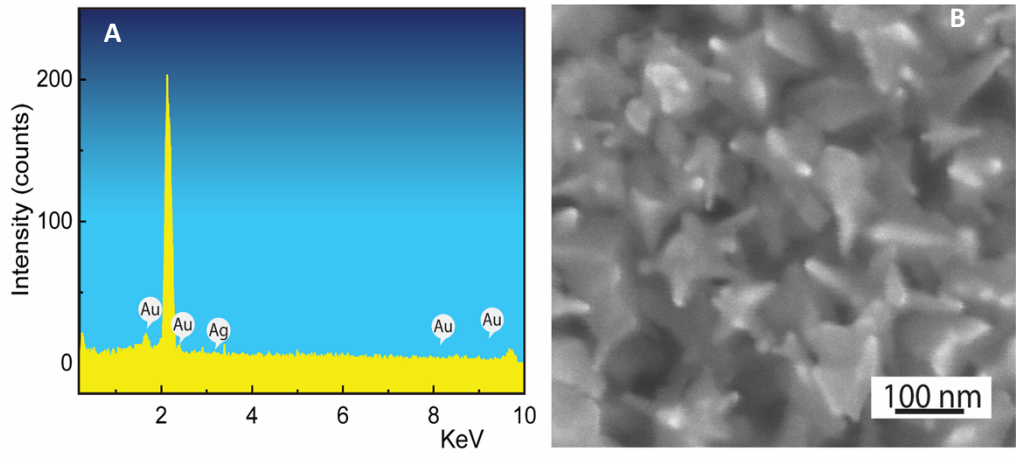

Fig. S2 (A) Energy dispersive X-Ray spectroscopy (EDS) and **(B)** scanning electron microscopy (SEM) of formed SGNPs.

Enhancement factor calculation

The calculation of the Enhancement Factor in the supplementary information based on the work of Miriam Parmigiani et al.[1] on the samples is in solution deposited on a substrate consisting of a layer of SGNPs deposed on a glass slide. A certain volume of 80 µL of STZ solution (concentration of 40 µg/mL) was dropped on a SGNPs substrate and another 80 µL of 10 mg/mL STZ was placed in blank glass slide to obtain the Raman signature intensity. The droplets of solutions was tightly clamped between two glass slides to form the almost uniform region.

EF evaluation was based on the equation [1]:

$$EF = \frac{I_{SERS} C_R h_R}{I_R C_{SERS} h_{SERS}}$$

Where I_{SERS} is the intensity of SERS peaks at 1441 cm^{-1} of the STZ solution investigated with SGNPs substrate, IR is the intensity of STZ aqueous solution without the nano substrates. C_{SERS} and C_R are the molar concentration of STZ solution in the SERS and Raman analysis. Based on the research of Miriam Parmigiani et al. [1], the h_R is estimated at approximately 18 µm, and h_{SERS} is lower than 10 nm, where the SERS signature is practically silent.

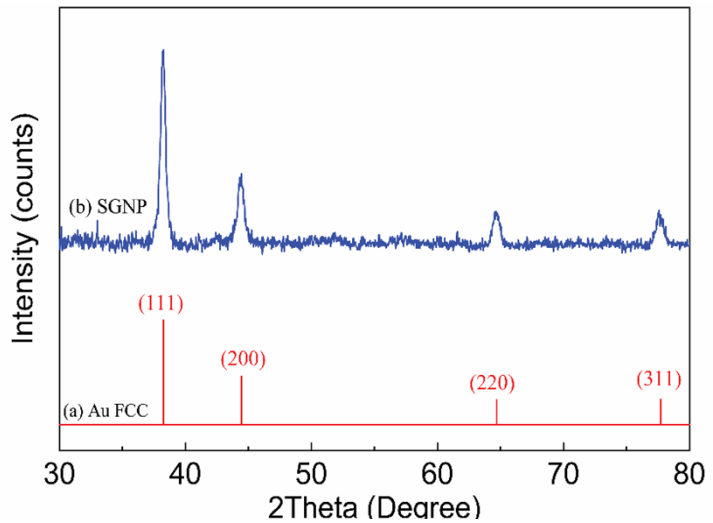

Fig. S3 X-Ray diffraction pattern of (a) Au fcc crystal and (b) as-synthesized SGNPs.

References

1. M. Parmigiani, B. Albini, G. Pellegrini, M. Genovesi, L. De Vita, P. Pallavicini, G. Dacarro, P. Galinetto and A. Taglietti, Journal, 2022, 12.