Application of Bare Gold Nanoparticles in Open-Tubular CEC Separations of Polyaromatic Hydrocarbons and Peptides

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Appendix A - Supporting Information

S1 Equipment and procedures used for characterization of GNPs and modified capillaries

S1.1 UV-VIS spectrophotometry

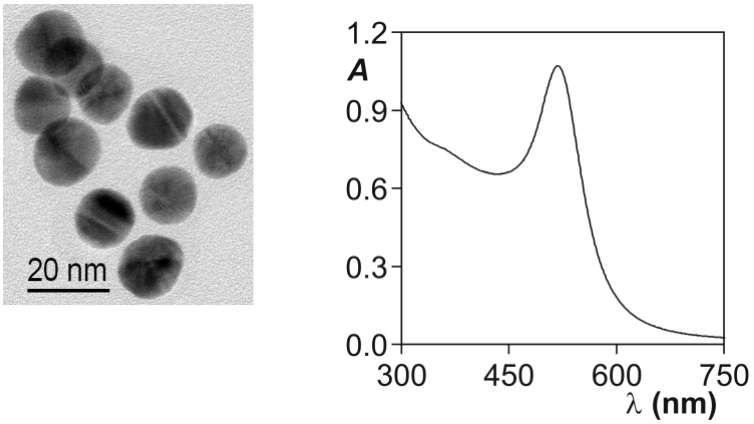
UV-Vis spectra of GNPs were measured by Cary 400 SCAN UV-Vis spectrophotometer (Varian, USA) and their transmission electron microscopy (TEM) images were obtained by JEM-3010 microscope (Jeol, Japan).

S1.2 ICP-MS

The ICP-MS measurements of gold immobilized in the sol-gel pretreated FS capillaries were carried out using an Elan DRC-e spectrometer (Perkin Elmer, Canada) equipped with Meinhard nebulizer, a cyclonic spray chamber, and Gilson 212 peristaltic pump. Quantification of gold was based on ^{197}Au. Stock solution (SS) (1 mg/mL) of Au was prepared by dilution of a standard solution 1.000±0.002 g/L Au (Merck, Germany). Stock solution (2 mg/mL) of Bi (used as the internal standard, IS) was prepared by dilution of a standard solution 1.000±0.002 g/L Bi (Merck). Both solutions were acidified with nitric acid (5 mL/100 mL) and final volume was adjusted with ultrapure water. Calibration solutions in water were prepared into 50 mL volumetric flasks using 0, 0.1, 0.25, 0.5 and 1 mL of the SS solution, 1 mL of IS solution and 2 mL of HNO_3. The resulting concentrations of the calibration solutions were 0, 2, 5, 10 and 20 ng/mL.

The amount of gold loaded in the capillaries was measured in solutions prepared by the following procedure. First, the polyimide capillary coating was removed by hot concentrated sulfuric acid. Then the capillary was completely dissolved in 3 mL of concentrated hydrofluoric acid and the resulting solution was evaporated to dryness. Next, 4 mL of concentrated nitric acid and hydrochloric acid mixture (1/3, v/v) was added to the residue of the capillary sample to dissolve gold and the solution was again evaporated to dryness. Finally, the residue was dissolved in 0.5 mL of nitric acid/hydrochloric acid (1/3, v/v) and transferred into the 25 mL volumetric flasks, to which 0.5 mL of IS solution was added and volume adjusted to 25 mL with water.

S2 Results and discussion



A B

Figure S1

Transmission electron microscopy (TEM) image (A) and UV-Vis spectrum (B) of the freshly prepared GNPs.