Surface Enhanced Raman Spectroscopy is a powerful tool in analytical chemistry due to its low detection limits, high selectivity, and large amount of substances that can be analyzed like pollutants, pesticides, pathogen agents, drugs, and explosives. The SERS detection of the analyte is achieved regardless of the presence of interferences; being able to detect even a single-molecule. The SERS spectra are recorded on noble metal substrates such as Ag, Au, Pt, Pd or Rh, and silver and gold nanostructured coatings due to the low cost compared to other noble metals. These noble metals are chosen because of their optical properties, which are attributed to their characteristic localized surface plasmon resonance.

In present work, silver dendritic nanostructures were obtained by electrodeposition of silver on aluminum sheets, applying a potential difference between the aluminum sheet and a silver sheet used as counter electrode in a solution of silver nitrate. Gold nanospheres were synthesized by chemical reduction of tetrachloroauric ions with citrate ions. The silver nanostructures were decorated with gold nanospheres by electrophoretic deposition. The SERS substrates were characterized by scanning electron microscopy, transmission electron microscopy, and Raman spectroscopy.

The SERS substrates were tested, obtaining analytical enhancement factors between $10^3$ and $10^5$, using rhodamine 6G as analyte. These values mean that the method can detect this analyte at concentrations below 1 ppm. This study provides a simple, very fast, reproducible and low-cost methodology for fabrication of SERS substrates, based on silver dendritic nanostructures decorated with gold nanospheres, which were obtained without templates or surfactant agents for the morphology control.

**Keywords:** SERS, dendritic nanostructures, noble metals

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