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# Cost-effective approach to fabricate highly sensitive surface enhanced Raman scattering (SERS) substrates

A low-cost, simple, repeatable method for obtaining Surface enhanced Raman scattering (SERS) platforms with an ordered distribution of gold nanoparticles and high enhancement Raman signal is presented. The platform is based on the decoration of Au / Ag nanoparticles into high-density Al nanoconcavities arrays. The nanostructured Al substrate follows a self-organized hexagonal pattern and are obtained by two-step electrochemical anodization of an Al substrate and the subsequent removal of the formed porous anodic [1-3]. The gold deposition time and the temperature and duration of the thermal annealing are determining parameters of the shape, size and arrangement of the gold nanoparticles formed on the Al templates alumina.

The size, shape, and arrangement of gold nanoparticles are dependent on the geometry of nanostructured Al substrates (nano-concavities, Figure 1) and the sputtering and thermal processes [4-6]. Also, a detailed evaluation of the different parameters of the fabrication steps is presented and how these platforms can be used as templates to create new SERS platforms with new features. The fabricated platforms have been demonstrated to be excellent sensing substrates for the detection of a broad range of molecules and medicines.

## References
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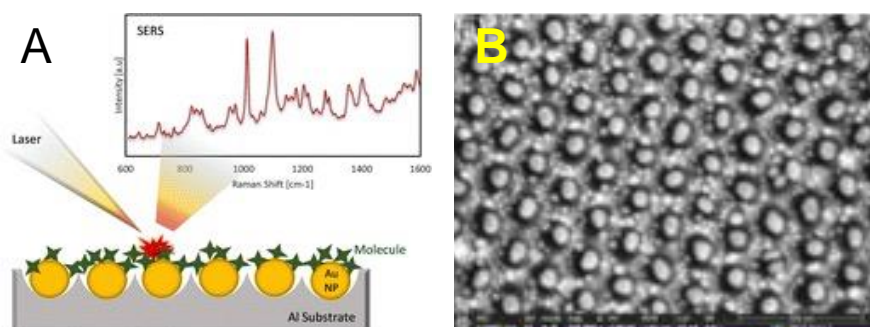
## Figures



**Figure 1:** A) Scheme of Au nanoparticles arranged on Al self-ordered nanoconcavites as platform for SERS. B) FESEM image of the gold nanoparticles on Al nanoconcavities.