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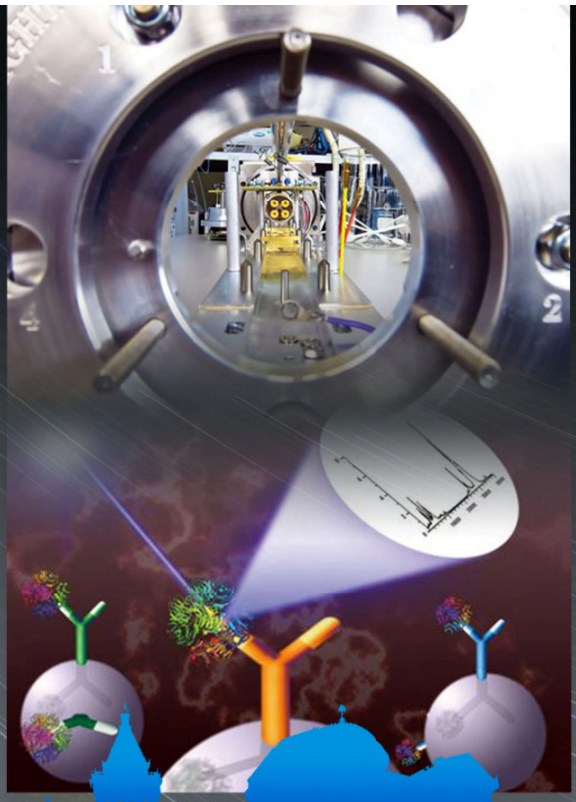

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BOOK OF ABSTRACTS

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P66
COUPLING ELECTROCHEMISTRY TO ELECTROSPRAY: A NOVEL PREPARATION OF GOLD NANOSTRUCTURES

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Keywords: *gold, nanoparticles, electrospray S.E.M.*

Objective: In this work we report the possibility of synthesizing and simultaneously depositing gold nanoparticles on ITO (Indium tin oxide) coated glass using the electrospray (ESI) method[1,2,3].

Method: The starting point of this study is that the ESI/MS spectrum (Figure 1) of an ethanolic solution of $HAuCl_4$ shows a reduction process of Au (III) strongly dependent on the Cone Voltage (CV) values (20, 80, 150 V), affording to the ion at m/z 197 (Au+). Further, the decrease of the abundance of this ion at the highest cone voltage suggests the subsequent its reduction with the formation of Au^0.

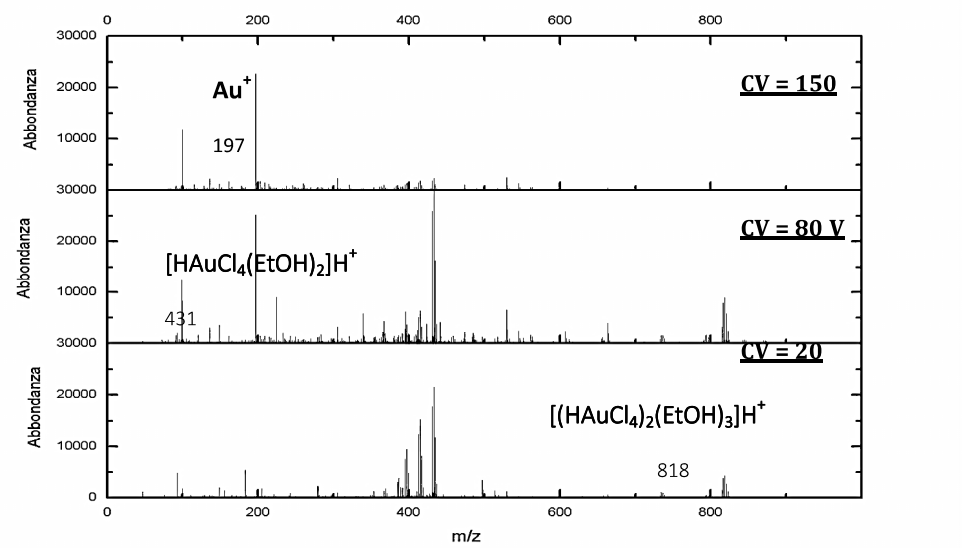

Figure 1: ESI/MS spectra of an ethanolic solution of HAuCl4 at various cone voltages:

Conclusion: Such experimental evidence leads us to use electrospray technique as a preparative tool to obtain the formation and deposition of gold nanoparticles in a single step.
In fact, using a home-made electrospray apparatus, we sprayed an ethanolic solution of HAuCl4, forming a very thin aerosol that has been uniformly deposited on ITO coated glass.
Then, the deposit by SEM, UV-Vis, Optical-Microscopy and XPS has been characterized4,5. In particular, SEM micrographs show rod-like structures, while XPS spectra show that the deposited nanoparticles contain about 23% of Au0.

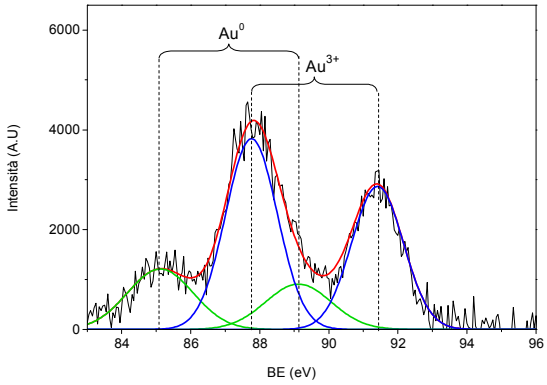

Figure 2: XPS spectra of the deposited nanoparticles

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