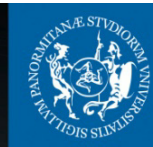




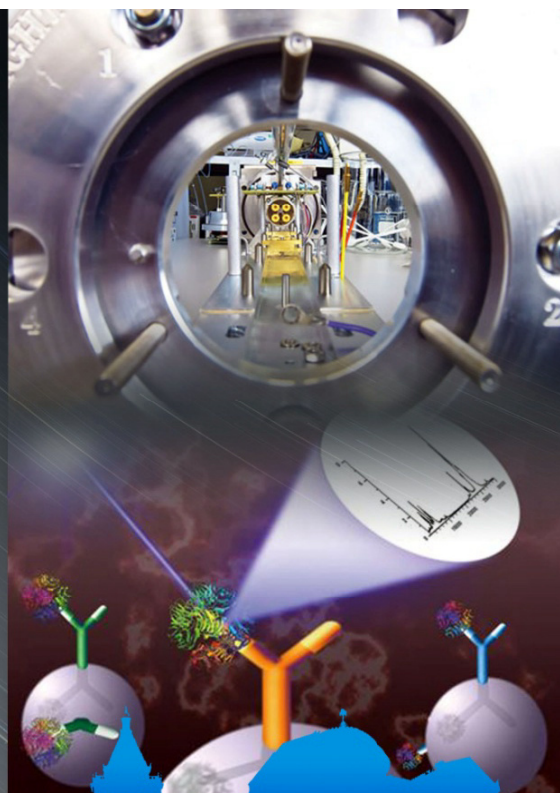
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BOOK OF ABSTRACTS



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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 H₂AuCl₄ 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 Au⁰.

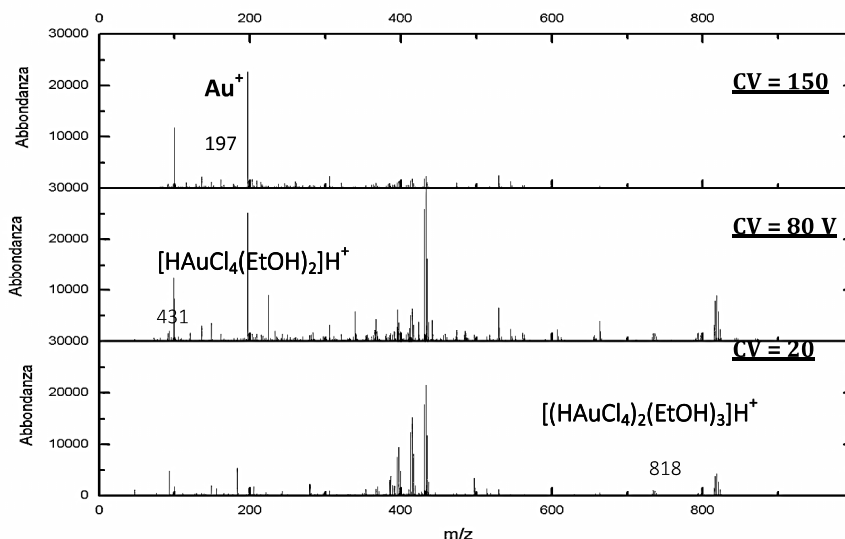


Figure 1: ESI/MS spectra of an ethanolic solution of H₂AuCl₄ at various cone voltages:

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 H₂AuCl₄, 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 characterized^{4,5}. In particular, SEM micrographs show rod-like structures, while XPS spectra show that the deposited nanoparticles contain about 23% of Au⁰.

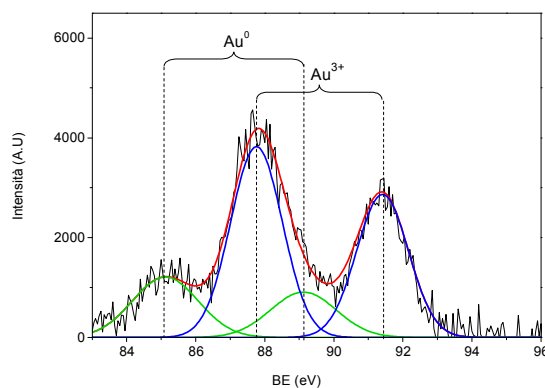


Figure 2: XPS spectra of the deposited nanoparticles

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