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Electrochemical TERS for the *in situ* characterization of structured molecular patterns -Towards the *operando* analysis of functional devices-

The nanostrucuration of surfaces, with thin molecular layers or specifically designed patterns, is nowadays exploited for a myriad of applications (from molecular sensing to catalysis, energy storage or conversion). Therefore, it is essential to improve both the sensitivity of the analytical methods that are used to characterize these novel materials, and the accuracy of the tools employed for the nanostructuration.
A promising candidate that fulfils these requirements is the EC-TERS (electrochemical tip-enhanced Raman spectroscopy) technique, which conjugates the high-quality results of the TERS analyses with the possibility of performing electrochemical sequences *in situ* [1,2]. More specifically, the work herein presented shows the performances of an improved EC-TERS setup, mounted in a scanning tunneling microscope (STM) [3,4], which was used to solve a complex electrochemical reaction (occurring on electroactive surface-grafted molecular layers) and gave preliminary results of surface patterning (by organic layers modification or metal oxides deposition).

References

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Figure

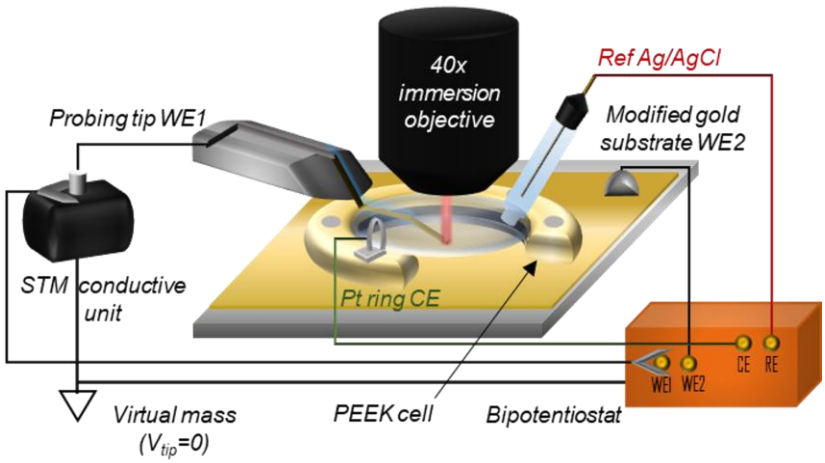

Figure 1: Schematic view of the implemented EC-STM-TERS setup