

Alice Fiocco ^a

Alexey Belyaev ^a, Dominique Verreault ^a, Alexander Yagovkin ^a, Juan Carlos González-Rosillo ^b, Beatrice Laurenti ^b, Marc Chaigneau ^a

^a HORIBA France SAS - 14, Boulevard Thomas Gobert - Passage Jobin Yvon – 91120 Palaiseau – France

^b Catalonia Institute for Energy Research (IREC) - Jardins de les Dones de Negre 1, Planta 2 – 08930 Sant Adrià del Besòs, Barcelona - Spain

alice.fiocco@horiba.com

Electrochemical TERS setups for *in situ* measurements at the nanoscale

Monitoring ongoing (electro)chemical reactions on nanostructures at high resolution is a matter of prime importance in those research fields (such as nanocatalysis or nanoelectronics) where knowledge is missing on the chemical transformations and morphological changes that concomitantly occur at the molecular scale. Electrochemical Tip-Enhanced Raman Spectroscopy (EC-TERS) can answer these needs: thanks to the latest developments, both in AFM [1,2] and STM [3,4] setups, it was possible to efficiently detect spatial- and/or potential-dependent spectral modifications occurring on molecular layers, as well as short-life intermediates.

An important requirement to perform easy and reproducible EC-TERS analysis is the optimization of the instrumental setup, which must maximize the TERS signal in liquid, synchronize spectro-electrochemical measurements and be compatible with several samples and working environments. The solutions proposed by HORIBA meet these requirements and will be presented in this contribution, along with a few successful results (Figure 1) obtained within the EU project Harvestore in collaboration with the IREC laboratory.

References

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Figures

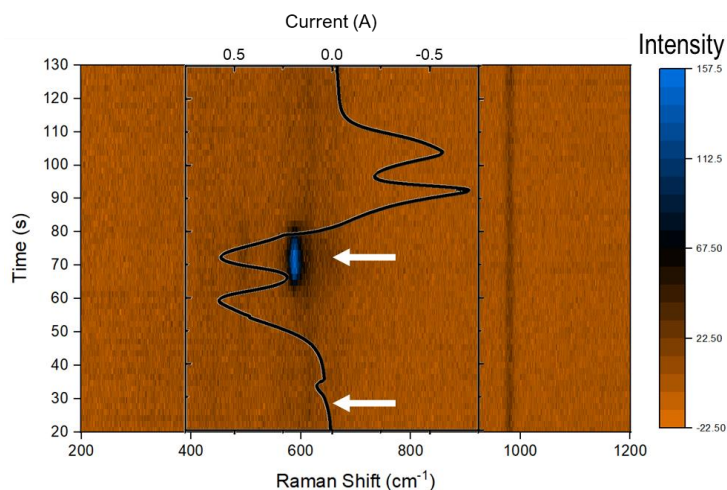


Figure 1: TERS and current signal evolution vs time, acquired on lithium manganese oxide in an EC-AFM-TERS setup.