

## AMPEROMETRIC SENSORS FOR THE ANALYSIS OF EXTRA-VIRGIN OLIVE OILS

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We report here the preliminary results obtained using a modified electrode covered by a particular conducting polymer, namely poly(3,4-ethylenedioxythiophene) (PEDOT) in the analysis of extra-virgin olive oils (EVOOs). The assay of the phenolic content of EVOOs is of great importance, since it is related to the resistance to oxidative deterioration, to the protective effect against chronic diseases, and to the organoleptic characteristics of EVOOs. The usual methods for the analysis of polyphenols in olives and olive oils require complex preparation procedures for the sample and time consuming measurements, so that they cannot be proposed as fast screening on-line methods. On the other hand, it is well known from the literature that phenolic compounds are only detectable at carbon based electrodes or at differently modified electrodes. Nevertheless, the non-conductive and apolar nature of oils often requires the use of toxic organic solvents, in order to perform the electrochemical measurements and to collect informative signals. To avoid these drawbacks, in our laboratory we performed extraction with aqueous solutions of a water/oil emulsion. In this system, PEDOT modified electrode give rise to a repeatable signal in which a well-defined current peak is detectable. Preliminary results obtained analysing various EVOOs, different for origin and olive cultivars, show a linear correlation between the height of the current peak and the content of ortho-diphenols, as determined by chromatographic analytical techniques. The whole procedure, including the preparation of the modified electrode and of the oil samples, has been checked in term of repeatability and reproducibility of the responses obtained. In particular, the fouling of the electrode, which is a very common event, does not occur at all or it does to a small extent. Beside the direct determination of polyphenol content, it is possible to envisage the use of PEDOT modified electrode as a unit of a sensor array constituting an electronic tongue. Such an approach will allow us to perform tasks such as recognition, qualitative analysis, and assessment of EVOOs sensory characteristics.