

Optimizing the Electrodeposition Protocol of Enantioselective Inherently Chiral Electrode Surfaces: a Multi-Technique Investigation

Serena Arnaboldi¹, Alessandro Tucci¹, Sara Grecchi¹, Francesco Orsini², Patrizia Mussini¹

¹ *Univ. degli Studi di Milano, Dip. di Chimica, Via Golgi 19, 20133 Milano, Italy*

² *Univ. degli Studi di Milano, Dip. di Fisica Aldo Pontremoli, Via Celoria 16, 20133 Milano, Italy*
serena.arnaboldi@unimi.it

We have recently introduced [1-2] "inherently chiral" enantiopure electrode surfaces of outstanding chirality manifestations, including circularly polarized luminescence, reversibly potential-driven circular dichroism, and large potential differences for the enantiomers of chiral probes in voltammetry experiments performed on such surfaces.

The outstandingly powerful "inherent chirality" concept implies a molecular structure where the stereogenic element does not consist in an isolated stereocentre or an external chirality source, but originates from a tailored torsion in the whole main backbone endowing the molecule with its key functional property (here electroactivity).

A key issue is now to investigate the enantioselection mechanism and to optimize the experimental protocols for the deposition of our inherently chiral surfaces. For both aims it is important to study the thickness and regularity of the chiral oligomer films as a function of the experimental conditions. We started a systematic atomic force microscopy (AFM) study correlated to electrochemical impedance spectroscopy measurements of the oligomer films obtained by carefully controlled electrodeposition, varying one by one different experimental parameters. The study is also important to properly compare enantioselection by films prepared from different inherently chiral monomers, including e.g. bisindole and tetrathiahelicene ones.

[1] F. Sannicolò, S. Arnaboldi, T. Benincori, V. Bonometti, R. Cirilli, L. Dunsch, W. Kutner, G. Longhi, P. R. Mussini, M. Panigati, M. Pierini, S. Rizzo, *Angew. Chem. Int. Ed.* **2014**, 53, 2623.

[2] S. Arnaboldi, P. Mussini, M. Magni, F. Sannicolò, T. Benincori, R. Cirilli, K. Noworyta, W. Kutner, *Chem. Sci.* **2015**, 6, 1706.