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"INHERENTLY CHIRAL" ELECTRODES: TOOLS FOR CHIRAL VOLTAMMETRY

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The development of artificial "intelligent" electrodes, capable to discriminate and quantify the enantiomers of chiral analytes is a quite attractive target in electroanalysis, and many approaches have been so far proposed, none of them however resolutive.
An effective solution is now provided from a new class, which we have recently presented[1-3] and patented, of "inherently chiral" molecular semiconductors, whose stereogenic element is a tailored torsion in the electroactive conductive backbone. The coincidence of the element granting both electroactivity and chirality with the entire molecular backbone results in extraordinary chirality manifestations (such as circularly polarized luminescence), finely and reversibly tuned by the electric potential. Above all, enantiopure electrode surfaces can be easily prepared *e.g.* by fast electrooligomerization, mostly consisting of cyclic oligomers, highly electroactive and chiral, idealizing conducting polymers without ends and of high complexing ability; they are able to discriminate enantiomers of chiral molecules in terms of large peak potential differences (80-200 mV and more), with linear dynamic ranges for peak currents, thus affording enantiomeric ratio evaluation. The same spectacular enantioselectivity is obtained on chemically different surfaces of the same structural concept, which demonstrates the general validity of our proposed strategy. A simple reconditioning protocol affords performing more experiments on a single electrode. The new electrodes have been tested with very good results on chiral probes even very different and of applicative interest[3] (Dopa and methyl-Dopa, ofloxacin, norepinephrine, tyrosine, naproxen, catechines, ascorbic acid...), on different supports, including commercial screen printed ones, and in different media (aqueous and nonaqueous ones, as well as ionic liquid drops on screen printed electrodes).

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