Synthesis of a new discotic type of conducting polymer.

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Discotic liquid crystal molecules contain plate-like cores, with 4-8 aliphatic tails. They stack to form columnar phases with long-range two-dimensional order of the columns and liquid-like intracolumnar order. Triphenylene-based discotic polymer has been studies as liquid crystal systems, showing several used into electronics field [1-3].

We have been found that the electrooxidation of 1,2-dimethoxybenzene produces the formation of radicals cationic species, hexamethoxytriphenilenes (HMTP) formed by three units of monomer, the association of HMTP with supporting anion permitted the growing of a conductor material called Polyveratrole [4-10] a tripheny-lene-based discotic polymer.

In this work, we can observe that the 1,2-diethoxybenzene oxidation produces a discotic type of conducting polymer, with a triphenylene substituted as repetitive unit. We performed the voltammetric and chronoamperometric studies of the monomer oxidation. Moreover, In situ IR experiments allowed us characterizing the doping process for this polymer using acetonitrile and tretrafluoroborate of tetrabutylammonium as supporting electrolyte.

Figure 1 shows the cyclic voltammetry response of an ethoxybenzene/tetrafluoroborate of tetrabutyl ammoniun system. At the first voltammetry peak (1,0V) we can observed the deposition of a green solid in the platinum surface, the constant increment of a current in a repetitive experiments is a indicative of a conducting properties of a material. Chronoamperometrics response (Fig. 2) showed oscillations corresponding with a multilayer growing followed fibrils grow, typical of discotic polymer.

The ex situ analysis (FTIR, NMR) of a material, showed a hexaethoxytriphenylenic structure with a tetrafluoroborate group as contraion. The doping process was followed by FTIR in situ, showing the insertion of a tetrafluoroborate contraion.

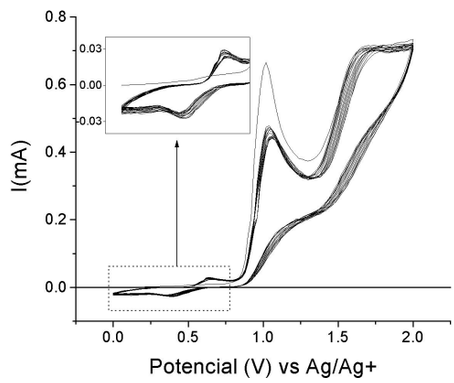

Figure 1. Cyclic voltammetric response during the oxidation of 1,2-diethoxybenzene in actetonitrile and tetrafluoroborate of tetrabutyl ammonium. ν = 100 mV/s.

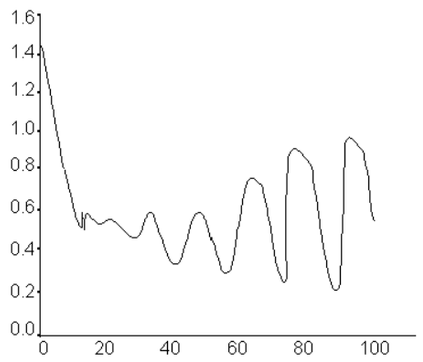

Figure 2. Chronoamperometric response during the oxidation of 1,2-diethoxybenzene.

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