ANODIC OXIDATION OF AZULENE-1-AZO-(4'-CHLOROBENZENE)

Cecilia Lete[1], N. D. Totir[1], A. C. Razus[2], Carmen Nitu[2], Simona Litescu[3], Camelia Bala[3]

1. Institute of Physical Chemistry, Spl. Independentei, 202, Bucharest, Romania
2. Institute of Organic Chemistry, Spl. Independentei 202 B, Bucharest, Romania
3. University of Bucharest, Faculty of Chemistry, Department of Analytical Chemistry

The enormous efforts put into the basic research and development of conducting polymers are naturally related to hopes of feasible technical applications[1]. Conducting polymers are discussed as potential electrochromic displays, information memories, antistatic materials, anticorrosives, electrocatalyzers, and as materials in molecular electronics and biomedicine[2 3].

Azulene-based materials which have received very limited attention in nonlinear optics are compounds which offer additional electronic features which could make them attracting candidates as multi-functional molecular devices[4].

Electrochemical behaviour of azulene-1-azo-(4'-chlorobenzene) was studied by cyclic voltammetric and potentiostatic method. The resulting compounds were characterised by the elemental analyses and by the NMR, UV and mass spectra.

The electrochemical oxidation of azulene-1-azo-(4'-chlorobenzene) leads to the formation of an electrically conducting organic polymer film at the electrode surface. Figure 1 shows the evolution of the cyclic voltammogram for film growth, on a platinum electrode, immersed in a monomer solution containing 1 mM of azulene-1-azo-(4'-chlorobenzene) in a 0.1 M solution of $[Bu_4N]^+[BF_4]^-$ in CH_2Cl_2 and the potential was continuously cycled between –1.0 V and 2 V at 100 mV/s.

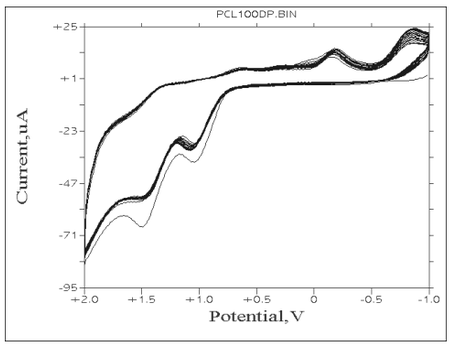

Fig. 1. Cyclic voltammograms of 1 mM azulene-1-azo-(4'-chlorobenzene) at a Pt electrode per TBATFB (tetrabutylammonium tetrafluoroborate) 0.1 M per CH_2Cl_2 with Ag/Ag^+

Electroformation of the azo-azulenes films has been also achieved by controlled potential electrolysis at 1.1 V.

[1] Kanoko M, Wohrle D 1988 in Cantaw H-J (ed) Advances in polymer sciences 84, Springer, Berlin Heidelberg New York, p. 141

[2] Gazard M 1986 Skotheim TA (ed) Handbook of conducting polymers, M. Dekker, New York, p 673

[3] Duke CB, Gibson HW 1982, Kirk-Othmer J (ed) Encyclopedia of chemical Technology, Wiley, New York, p 755

[4] P. Lacroix. I. Malfant, G. Iftimie, A. C. Razus, K. Nakatani, J. Delaire, Chem. Eur. J., 2000, 6, No. 14.