THE SPECTROELECTROCHEMICAL INVESTIGATION OF SOME AZO DYES CONTAINING BISAZOBENZO[c]CINNOLINE

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Aromatic and heteroaromatic azo compounds constitute the largest and the most diverse group of synthetic dyes with application not only as textile colorants but also in many other industrial fields for coloring different substrates, biological-medical studies, in the field of non-linear optics and optical data storage [1]. Benzo[c]cinnolines are useful intermediates which can be used in the production of dyes, colored polymers, dye bleach catalyst, photoconductors, and photosensitizers [2]. Bisazobenzo[c]cinnolines were synthesized from the coupling reactions of diazotized arylamines (4-aminobenzonitrile, aniline, 3-nitroaniline, 4-trifluoromethylaniline) with 3,8-dihydroxybenzo[c]-cinnoline. Substance examined in this study is given in the Scheme 1. Detailed synthesis procedures for bisazobenzo[c]cinnolines were reported previously [3].

\[ \text{Scheme 1, The investigated bisazobenzo[c]cinnolines.} \]

The electrochemical and spectroelectrochemical behaviors of bisazobenzo[c]cinnolines were investigated by cyclic voltammetry on Pt electrode in dry solvents containing 0.1 M of TBAP as an electrolyte under nitrogen atmosphere. The three electrodes one-compartment spectroelectrochemical cell system was used in all electrochemical experiments. Pt disc was used as working electrode, a platinum wire as a counter electrode and Ag/AgCl as reference electrode. During the spectroelectrochemical measurement Pt gauze electrode was used as the working electrode. The UV-Vis. spectroscopic behaviors of bisazobenzo[c]cinnolines were investigated in solutions of the substances using acetonitrile (ACN), N,N-dimethylformamide (DMF), dimethyl sulfoxide (DMSO) and dichloromethane (MeCl₂) as solvents. Experimental results show that the bisazobenzo[c]cinnolines used in this study possess electrochromic and solvatochromic properties.

References