

**VOLTAMMETRY OF TRYPTOPHAN ENANTIOMERS ON GLASSY CARBON
ELECTRODES MODIFIED BY POLYARYLENEPHTHALIDE COMPOSITES
OF α -, β -, AND γ -CYCLODEXTRINS**

Murzina K. A., Zilberg R. A., Khabletdinova A. I.

Bashkir State University, Ufa, 32, Validy st., 450076, Russia

ZilbergRA@yandex.ru

Tryptophan (Trp) or 2-amino-3-(1H-indol-3-yl)-propionic acid is known to be irreversibly oxidised in phosphate buffer solution on modified glassy carbon electrodes (GCE)s with the transfer of two electrons.

In the investigated potential range the enantiomers of Trp in phosphate buffer solution on polyarylenephthalide (PAP)-modified GCE were oxidised with formation of corresponding peaks. Analytical signals of the Trp enantiomers differed slightly from each other. When a modifier (α -, β - or γ -CD) is added to the PAP, PAP composites are deposited on GCE surfaces. The differential pulse voltammograms of the Trp enantiomers on these electrodes differ among themselves. This is due to the fact that molecules of CDs can form inclusion complexes with Trp, which act as chiral selectors. To determine the optimum experimental conditions, the effect of the pH of the analysed solution, the potential sweep rate, the electrode holding time in the analysed solution, the concentration of Trp enantiomers on the current values, and the shape of the voltammograms were studied. Criteria of optimization were sensitivity, standard deviation, and correlation coefficients of calibration plots. Electrochemical and analytical characteristics of differential pulse voltammograms of Trp enantiomers on the GCEs modified by PAP composites of α -, β - or γ -CD in concentration range 4–70 μ M are shown in Table.

Table. Characteristics of DPVs of D- and L-enantiomers of Trp (0.035 mM) oxidizing on the GCEs modified by PAP composites of α -, β - and γ -CD in phosphate buffer solution (pH 6.86) at a scan rate of 20 mVs⁻¹

Electrode	E_p , V		I_p , μ A		$\Delta I_p / \Delta C$, μ A μ M ⁻¹		C_{min} , μ M
	D-Trp	L-Trp	D-Trp	L-Trp	D-Trp	L-Trp	
GCE/PAP/ α -CD	0.58	0.57	7.46	7.72	0.057	0.065	4.0
GCE/PAP/ β -CD	0.65	0.66	7.39	8.75	0.084	0.098	4.0
GCE/PAP/ γ -CD	0.65	0.66	7.42	8.83	0.063	0.072	7.0

The standard calibration plots show that GCEs modified by PAP composites of α -, β - and γ -CD exhibited enantioselective discrimination of Trp enantiomers over this concentration range. The most significant differences between the Trp enantiomer responses are observed on the electrodes modified by PAP composites of β - and γ -CD. Thus, modified by PAP and CDs electrodes can be used in the electrochemical determination of Trp enantiomers.

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