

# "Electronic tongue" based on electrodes modified with polyarylenephthalides for recognition of model solutions of tryptophan

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## Abstract

The effect of auxiliary substances in the composition of the dosage form (sucrose, lactose, talc and starch) on the voltammetric registration of tryptophan using two- and three-sensor systems such as "electronic tongue" based on glassy carbon electrodes modified with polyarylenephthalides was studied. For the subsequent chemometric processing of the obtained data, the principal component analysis and soft independent modeling of class analogies were used. It has been shown that electrodes modified with various polyarylenephthalides have cross-sensitivity to four model solutions of tryptophan, each of which contains a certain auxiliary component. When the modified electrodes are used separately, the analyzed model solutions of tryptophan form clusters on the score plots of PCA that intersect with each other, which does not allow them to be reliably recognized. However, the combination of modified electrodes into two- and three-sensor systems due to cross-sensitivity makes it possible to obtain the PCA score plots, in which clusters of samples of model solutions of tryptophan intersect less or do not intersect at all, and, therefore, to recognize them with a high probability. In almost all cases of using two- and three-sensor systems, the classification sensitivity is 100%. When using modified electrodes separately, the specificity of the classification varies from 20 to 100%, when using two-sensor systems – from 50 to 100%. The specificity of the classification when using a three-sensor system is not less than 90%. The proposed sensor system, after additional studies, can be used to recognize medicines containing the same active substance, but different auxiliary components, and will also allow detecting the presence of impurities in medicines.

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