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Solid-contact potentiometric sensors and multisensors based on polyaniline and thiacalixarene receptors for the analysis of some beverages and alcoholic drinks

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Abstract

© 2018 Sorvin, Belyakova, Stoikov, Shamagsumova and Evtugyn. Electronic tongue is a sensor array that aims to discriminate and analyze complex media like food and beverages on the base of chemometrics approaches for data mining and pattern recognition. In this review, the concept of electronic tongue comprising of solid-contact potentiometric sensors with polyaniline and thacalix[4]arene derivatives is described. The electrochemical reactions of polyaniline as a background of solid-contact sensors and the characteristics of thiacalixarenes and pillararenes as neutral ionophores are briefly considered. The electronic tongue systems described were successfully applied for assessment of fruit juices, green tea, beer, and alcoholic drinks They were classified in accordance with the origination, brands and styles. Variation of the sensor response resulted from the reactions between Fe(III) ions added and sample components, i.e., antioxidants and complexing agents. The use of principal component analysis and discriminant analysis is shown for multisensor signal treatment and visualization. The discrimination conditions can be optimized by variation of the ionophores, Fe(III) concentration, and sample dilution. The results obtained were compared with other electronic tongue systems reported for the same subjects.

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Keywords

Electronic tongue, Food analysis, Polyaniline, Potentiometric sensors, Solid-contact sensors

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