The possibility of application of the potentiometric sensor with all-solid-state electrodes containing lipid-polymer membranes for classification of tested black leaf teas in terms of their quality

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ABSTRACT

Potentiometric sensor with all-solid-state electrodes containing lipid-polymer membranes for a set of black leaf teas coming from four countries (China, India, Sri Lanka and Kenia) classification was applied. The tested tea samples were reassigned to quality classes marked with numbers I–V according to the information available. The sensor results of tea samples are presented in the form of radar charts. It was observed that, in the majority of cases samples with a similar radar chart shape belong to the same quality class. Based on principal component analysis and agglomerative hierarchical clustering analyses four groups of leaf tea samples and two separate items were distinguished. The first group was constituted by the highest quality Yunnan teas. The second group is made up of high-quality Indian teas and one tea sample of undeclared quality. The third group includes tea samples of unknown quality assigned to quality Class IV. The last group distinguished is constituted by the sample of Indian Madras and Ceylon tea, which are imported for retail trade for blends. This grouping largely corresponds to the quality classes of tested tea samples. The obtained results suggest that potentiometric sensor with all-solid-state electrodes containing lipid-polymer membranes might be used for discrimination of black leaf teas of different quality and also for determination of quality class of an unknown tea sample.

Keywords: Quality estimation; Lipid-polymer membranes; Leaf teas quality; All-solid-state electrodes; Principal component analysis and agglomerative hierarchical cluster analysis

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