

Approaches to elaboration for Sodium benzoate determination methods in food products

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Introduction. Food additives are widely used in modern industry. Food additives are substances of natural or synthetic origin that are introduced into food products to increase shelf life, taste, texture or appearance. One of the representatives of this class of substances is sodium benzoate, a benzoic acid salt. It is a white crystalline powder, odorless or with a slightly perceptible odor, sweetish-salty taste, easily soluble in water [1, 2]. Due to its water solubility and boiling stability, this compound is widely used today in various industries. Sodium benzoate is used medicinally as an expectorant, mucolytic, and antimicrobial agent. In the cosmetic, pharmaceutical and food industries it is used as a preservative, due to its action, namely a strong inhibitory effect on yeast and mold fungi by suppressing the activity of enzymatic systems in their cells, which are responsible for redox reactions, as well as cleaving fats and starch. It is approved for use for canning meat, fish products, margarines, mayonnaise, carbonated drinks, etc. The quantitative content of sodium benzoate in these foods is strictly regulated [3].

In this regard, an urgent issue is the use of methods for the detection and quantification of sodium benzoate in food, which are accurate, reliable and modern. Based on the methods proposed by the European Pharmacopoeia, the United States Pharmacopoeia [1], and the State Pharmacopoeia of Ukraine, as reactions that allow the identification of sodium benzoate by cation, the most widely used reactions are interactions with a solution of potassium pyroantimonate. For the detection of benzoate ion, the most used is the reaction of interaction with a solution of iron trichloride. The quantification method is non-aqueous acidimetry in glacial acetic acid with perchloric acid titration using crystal violet as an indicator [1, 4]. It is also possible to determine sodium benzoate by acidimetry in the presence of diethyl ether using methyl orange and methylene blue as an indicators [4]. Methods of spectrophotometry, and chromatographic methods are used [5].

The aim. We are considering the possibility of testing the use of titrimetry and spectrophotometry methods for the analysis of sodium benzoate in food products.

Materials and methods. Method of acidimetry in aqueous medium titrating with hydrochloric acid at the presence of the mixture (1:1) methyl orange and methylene blue and method of UV-spectrophotometry at a wavelength of 224 nm were used.

Results. Quantification of sodium benzoate was carried out, techniques were metrologically tested.

Conclusions. Techniques can be applied for quantification of sodium benzoate in food products.

References

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