

QUANTITATIVE ESTIMATION OF NEW BIOLOGICALLY ACTIVE SUBSTANCES OF DERIVATED 4,5-DIMETHOXY-N-PHENYL- ANTHRANILIC ACIDS

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The method for quantitative estimation of 4,5-dimethoxy-N-phenylanthranilic acids was defined by the two-phase titration. Principle of the method consists in direct titration by alkali solution of two-phase system which is compounded of organic phase that encloses substances being analyzed, and of water phase that encloses indicator. The endpoint size of titration is defined according to decolorization of the water layer. The method is characterized by a high accuracy, simplicity, expressiveness. Relative error in the method does not exceed 0.5%.

The aim of research is developing of express method for quantitative estimation of 4,5-dimethoxy-N-phenylanthranilic acids by the method of two-phase titration in a system octanol – water.

Equipment and reagents for quantitative estimation of mefenamic, tolfeamic and 4,5-dimethoxy-N-phenylanthranilic acids by the method of two-phase titration: microburette of class A (capacity – 5ml); glass-stoppered measuring flask (capacity – 100ml); n-octanol; 0.1% alcohol solution of thymolphthalein; sodium hydroxide (0.1M solution). All reagents and solutions were prepared according to demands of SPhU.

Potentiometric titration was conducted in mixed solvent «dioxane - water» (60 volume % dioxane) in ionomer I-160 with application of indicating glass electrode (ESP 43-07) and silver chloride (EVL - 1M4) reference electrode.

The quantitative calculation of the content of 4,5-dimethoxy-2-(phenylamino)benzoic, mefenamic and tolfeamic acids, %, is being performed by the formula:

$$\% = \frac{V \times K \times T \times 100}{m_s}$$

where V – volume of 0.1M solution of the sodium hydroxide, used for titration, ml;

K – correction coefficient to molarity of the 0.1M sodium hydroxide solution;

T – titre of the 0.1M sodium hydroxide solution according to the experimental compound, $g \times ml^{-1}$;

m_s – mass of the experimental compound batch, g.

We have developed the express method for quantitative estimation of 4,5-

dimethoxy-N-phenylanthranilic acids. The method of two-phase titration with the presence of indicator that is not being extracted by organic solvents was taking as a basis. Principle of the method consists in direct titration by a standard water solution of sodium hydroxide of two-phase system which is compounded of the organic phase that encloses salvation of the experimental compound, and the water phase that encloses indicator. There is the extraction disbalance within the titration by sodium hydroxide solution and the sodium salt of 4,5-dimethoxy-N-phenylanthranilic acid rises into water phase. The endpoint size of titration is defined according to decolorization of the water layer.

The optimal conditions for two-phase titration of non-described in literature 4,5-dimethoxy-N-phenylanthranilic acids were determined. N-octanol is being used as an organic solvent which solves well the experimental compounds. The choice of N-octanol as a solvent is caused both by a good solvability, and a usage of the octanol-water mixture as a model one for evaluation of lipophilic activity of biologically active substances. The experimentally founded correlation of volume in the water and organic phases equal 2:1. As indicators 0.1% alcoholic solution of phenolphthalein, 0.04% alcoholic solution of m-cresol purple and 0.1% alcoholic solution of thymolphthalein can be used. According to data it is evident that the alcoholic solution of phenolphthalein is the most acceptable indicator because the ≈ 0.1 g batch of the experimental substances is enough while this solution is being used.

The obtained results of quantitative estimation by the two-phase titration are characterized by the accuracy and representativity. The relative uncertainty of the average result by this method does not exceed 0.5%. The method developed is expressive, easy to use, and reliable. These characteristics is differed this method advantageously from the method of potentiometric titration.

Nature of substitutes and their location in anthranilic fragments of 4,5-dimethoxy-N-phenylanthranilic acids do not affect on the quantitative estimation results.

CONCLUSION

1. The express method for quantitative estimation of 4,5-dimethoxy-N-phenylanthranilic acids by the two-phase titration in a system octanol-water has been defined.

2. The optimal conditions for two-phase titration in a system octanol-water have been determined, the indicator has been chosen, which application let to use less amount of the experimental substance. The method developed is characterized by simplicity, expressiveness, reliability and a high enough accuracy.