QUANTITATIVE SPECTROPHOTOMETRIC DETERMINATION OF PRODIGIOZAN USING PHENOL IN SULFURIC ACID

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The group of bacterial polysaccharides used as medicinal preparations includes Prodigiozan, which is isolated from the microorganism Bac. prodigiosum. Prodigiozan is used in medicine in the form of 0.005% ampul solutions as an immunostimulator and an agent of nonspecific therapy [1].

A procedure for the spectrophotometric determination of sugars is known from the literature that is based on their interaction with phenol in the presence of concentrated sulfuric acid; the complex formed as a result of the reaction has a yellow-orange color which is stable for several hours [2].

The biologically active fraction of Prodigiozan is a polysaccharide, and this method has therefore been used for the quantitative determination of Prodigiozan.

As a standard, we have used Prodigiozan material corresponding to all the requirements of the NTD [Standardization Documentation]. It has been established that on the addition of a 5% solution of phenol in sulfuric acid to a solution of Prodigiozan a colored compound is formed that has its absorption maximum at λ_{max} 480 nm. We have selected the optimum conditions for the performance of the reaction. It has been found that within the range of concentrations from 10 to 30 μg/ml the optical densities of the solutions obey the Bouguer–Lambert–Beer law. A method for the quantitative determination of Prodigiozan has been developed on the basis of the investigations performed.

Procedure. To 1.5 ml of a 0.005% solution of Prodigiozan is added 0.5 ml of a 5% aqueous solution of phenol and 3 ml of concentrated sulfuric acid. The optical density of the solution obtained is measured on a Beckman DU-7 spectrophotometer (USA) at a wavelength of 480 nm in a cell with a layer thickness of 10 mm. As the control solution we have used a 0.9% solution of sodium chloride with the addition of the same reagents. The amount of Prodigiozan in 0.005% ampul solutions was calculated from the formula

$$X = \frac{D_{an} \cdot 15 \cdot 5}{D_{st}},$$

where D_{an} and D_{st} are the densities of the solution being analyzed and of the standard solution, respectively;

15 is the amount of Prodigiozan in 1 ml of standard solution, μg/ml; and
5 is the dilution of the solution being analyzed.

Metrological Characteristics

n	$\bar{X}$%	S	$S_{\bar{x}}$	$\pm E$	$\pm A$%
5	90 3	0.7793	0.3485	0,8959	0,9921

LITERATURE CITED

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