SPECTROPHOTOMETRIC DETERMINATION OF METHYLAPOGALANTHAMINE HYDROCHLORIDE

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The substance methylapogalanthamine hydrochloride, obtained from galanthamine [1], is used in medicine as a new hypotensive agent.

In the present paper we propose a spectrophotometric method for determining this preparation which differs from nonaqueous and mercurimetric titrations (MRTU [Inter Republican Technical Standard] 42 no. 3516-67 and 42 no. 3519-67) by its rapidity, specificity, and minimum consumption of materials.

In the UV spectrum of methylapogalanthamine hydrochloride there is an absorption maximum at 293 mμ (log ε 3.49) [2]) which is suitable for spectrophotometric determinations. In the range of working concentrations the absorption of solutions of the substance obey the Bouguer-Lamber-Beer law.

Determination of the preparation in a powder. About 5–8 mg (accurately weighed) of the substance was dissolved in water in a 100-ml measuring flask. The optical density was measured at 293 mμ (against water) in an SF-4 spectrophotometer in a cell 1 cm thick; the optical density of a standard solution was measured under the same conditions [5 mg (accurately weighed) of the standard in 100 ml of water]. A pharmacopeal preparation recrystallized from ethanol (1 : 2), mp 164–165° C, was used as the standard. The content of the preparation X (%) calculated on the absolutely dry weight was calculated from the formula

$$X = \frac{a_{st} \cdot D_x \cdot 100 \cdot 100}{D_{st} \cdot (100-h)\, P},$$

where a is the weight of the standard, mg;

D_{st} and D_x are the optical densities of the standard solution and the solution under investigation;
h is the moisture content, %; and
P is the weight of the preparation, mg.

The results of the analysis of the substance in a powder are given in the table (the symbols are the generally-adopted ones [3]).

Results of the Analysis of Methylapogalanthamine Hydrochloride

Amount taken, mg	Found, %	$(X-\overline{X})$	$(X-\overline{X})^2$	Statistical factors
3.640	98.84	−1.47	2.161	$S^2=1.235$
2.520	100.40	+0.09	0.008	$S=1.111$
2.990	99.34	−0.97	0.941	$S_{\overline{x}}=0.370$
7.610	98.83	−1.48	2.190	$a=0.950$
7.040	100.42	+0.11	0.012	$t_{ac}=2.306$
4.520	101.76	+1.45	2.103	$E_a=0.853$
6.280	101.75	+1.44	2.074	$E_{rel}=0.850\%$
6.960	100.86	+0.55	0.303	
6.610	100.61	+0.30	0.090	
	Sum		Sum	
	902.81		9.882	
	$\overline{X}=100.31$			

Determination of the preparation in a 0.2% ampule solution. The contents of several ampules were mixed, 1 ml was transferred to a 50-ml measuring flask, and water was added to the mark. The optical density of the solutions was measured as described above. The content of the substance X (g) in 1 ml of solution was calculated from the following formula:

$$X = \frac{c_{st} \cdot D_x \cdot V}{D_{st} \cdot 1000},$$

here c_{st} is the concentration of the standard solution, mg/ml; and V is the dilution, ml.

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