# AN EXTRACTION-PHOTOMETRIC DETERMINATION OF VINCAMETRINE

R. A. Mirkina and T. T. Shakirov

UDC 547.944/945+543.420.62

The preparation vincametrine is the hydrochloride of the alkaloid vincamine, which is isolated from the epigeal part of Vinca erecta Rgl. et Schmalh [1, 2].

In the present paper we propose a method for the extraction-photometric determination of vincametrine based on the capacity of organic bases for forming with certain dyes addition products which are soluble in organic solvents [3]. In this case we have used the dye Tropaeolin 000.

The study of the dependence of the optical density of the solutions of the complex of vincametrine with Tropaeolin 000 on the acidity of the medium showed that the maximum optical density is achieved at pH 3.0-3.1. All subsequent determinations were performed at this acidity of the medium. The composition of the complex was established by the method of isomolar series (Fig. 1). On the curves of the isomolar series there are well-defined light-absorption maxima at a 1:1 ratio of the components.

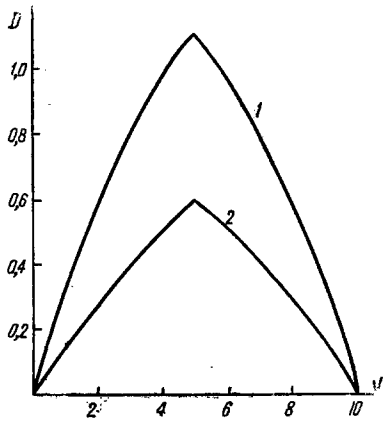


Fig. 1. Curves of isomolar series. Total volume 10 ml, total concentration: 1) $1.0 \cdot 10^{-3}$ M; 2) $4.6 \cdot 10^{-4}$ M.

The molar absorption coefficient and the equilibrium constant of the reaction were determined by Tolmachev's method [4]. The true molar absorption coefficient of the complex is 12,750; the equilibrium constant of the reaction $K_e$ = 565; and the minimum amount detectable 4 $\mu$g/ml.

## EXPERIMENTAL

An accurately weighed sample (5 mg) was dissolved in a 25-ml measuring flask, 1 ml of the resulting solution was transferred to a separating funnel, 5 ml of citrate-phosphate buffer solution with pH 3.0-3.1 and 5 ml of a 0.1% solution of Tropaeolin 000 were added, the mixture was shaken, and the complex formed was extracted with chloroform. The chloroform extracts were separated

TABLE 1

| Amount taken, mg | Found, % | $(x - \bar{x})$ | $(x - \bar{x})^2$ | Statistical indices |
|---|---|---|---|---|
| 5,12 | 100,39 | +0,90 | 0,810 | $s^2 = 1,511$ |
| 5,28 | 98,58 | −0,91 | 0,828 | $s = 1,229$ |
| 4,82 | 99,10 | −0,39 | 0,152 | $s_{\bar{x}} = 0,549$ |
| 5,07 | 101,25 | +1,76 | 3,098 | $\alpha = 0,95$ |
| 4,91 | 98,70 | −0,79 | 0,624 | $t_{\alpha, \kappa} = 2,447$ |
| 5,20 | 100,92 | +1,43 | 2,045 | $E_\alpha = 1,343$ |
| | $\Sigma$ 598,94 | | $\Sigma$ 7,557 | $E_{rel} = 1,350\%$ |
| | $\bar{x}$=99,49 | | | |

Institute of the Chemistry of Plant Substances, Academy of Sciences of the Uzbek SSR. Translated from Khimiya Prirodnykh Soedinenii, No. 1, pp. 59-60, January, 1971. Original article submitted October 28, 1970.

off and combined in a 25-ml measuring flask and made up to the mark with chloroform; the optical density of this solution was measured on an FÉK-M photocolorimeter with a blue filter in a cell with a layer thickness of 1 cm.

The optical density of a standard sample was measured under the same conditions. The standard sample of vincametrine, with mp 233°C, was obtained by two recrystallizations from methanol. The results of the analysis of a preparation in powdered form are given in Table 1.

## SUMMARY

An extraction-photometric method for determining the preparation vincametrine has been developed. The relative error of the method does not exceed ±1.5%.

## LITERATURE CITED

1. S. Yu. Yunusov and P. Kh. Yuldashev, Zh. Obshch. Khim., 27, 2015 (1957).
2. P. Kh. Yuldashev, V. M. Malikov, and S. Yu. Yunusov, Dokl. Akad. Nauk UzSSR, 1960, No. 1, 25.
3. V. S. Konyushko, Zh. Analit. Khim., 19, 1012 (1964).
4. Sh. T. Talipov, Kh. S. Abdullaeva, and N. A. Romanova, Uzb. Khim. Zh., 1964, No. 3, 16.