QUANTITATIVE DETERMINATION OF d-RIBOSE

AND d-ARABINOSE IN INDUSTRIAL SAMPLES

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UDC 547.455.522+547. 455.524]:543.544.062

Paper chromatography, permitting the separate determination of d-ribose and d-arabinose in their mixtures, was used for the quantitative determination of these sugars.

Chromatography was ascending, duration 16-20 h, temperature 20-25°. Schleicher-Shull 2043 paper in MgI was used in the work; solvent system n-butanol-acetic acid-water in a 4:1:5 ratio [1]. After separation, the sugars were developed with aniline phthalate reagent [2, 3]. The reddish brown spots were eluted from the paper at the optical density measured at the absorption maximum at the wavelength 355 nm. The Beer-Lambert law was observed in the concentration range 20-120 μ g. The values of $E_{1cm}^{1\%}$ of dribose and d-arabinose were determined on the pure substances (Table 1).

The method was tested on artificial mixtures of d-ribose and d-arabinose (Table 2). The relative error did not exceed 10%.

EXPERIMENTAL

Samples of d-ribose and d-arabinose from Merck were used as the standards: d-arabinose, mp 157-160°, $[\alpha]_D^{20}$ -103-105°; d-ribose, mp 86-87°, $[\alpha]_D^{20}$ -22.1°.

Aniline Phthalate Reagent. We dissolved 1.66 g phthalic acid and 0.91ml of aniline, redistilled twice over zinc, in a mixture of 48 ml n-butanol, 48 ml ethyl ether, and 4 ml water.

Eluting Reagent (0.7 N Solution of Hydrochloric Acid in 80% Ethanol). For its preparation, exactly 29 ml concentrated hydrochloric acid and 420 ml ethanol (fractional distillate) were placed in a 500 ml volumetric flask and brought up to the mark with water.

Determination of d-Ribose and d-Arabinose in Industrial Samples. A weighed sample of about 2 g was dissolved in water in a 50 ml volumetric flask, and 0.02 ml of the solution was applied on paper with a micropipette. The paper was dried in air and chromatographed in the solvent system. The chromatogram was dried in air for 2 h, and the spots of the sugars developed with aniline phthalate reagent. Then the paper was again dried in air for 30 min and heated in a drying oven at 105° for 10 min. Equal

TABLE 1. Results of Determination of the Values of $E_{1 \text{ cm}}^{4\%}$ of d-Ribose and d-Arabinose

Statistical charac- teristics	d- Ribose	d- Arabi- nose
Number of deter- minations (n)Average result (x) Accuracy of determina- tion of the average result at $\alpha = 0.95$ Relative error of the average result in percent	12 262,6 4,91 1,86	12 265 3,18 1,20

TABLE 2. Results of Determination of d-Ribose and d-Arabinose in Artificial Mixtures

					the state of the s	
Taken (in µg)			Found			
total	including		d-ri-	error		error
	d- ribose	d- arabi- nose	bose (in µg	(in %)	d-aral nose (in μg	(in %
110,5 110,5 88,4 184,7 162,0 167,1	55,5 55,5 44,4 84,4 80,0 105,5	55,0 55,0 44,0 100,3 82,0 61,6	57,2 49,8 41,5 80,0 82,0 95,8	3,0 10,2 6,5 5,2 2,5 9,2	54,5 52,2 41,7 98,0 81,0 61,0	0,9 5,1 5,2 2,0 1,2 1,0

Bolokhov Chemical Combine of Synthetic Intermediates and Vitamins. Translated from Khimiko-Farmatsevticheskii Zhurnal, Vol. 7, No. 6, pp. 57-58, June, 1973.

• 1974 Consultants Bureau, a division of Plenum Publishing Corporation, 227 West 17th Street, New York, N. Y. 10011. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, microfilming, recording or otherwise, without written permission of the publisher. A copy of this article is available from the publisher for \$15.00. areas of the spots of the sugars were cut out and placed in a test tube with 5 ml of the eluting reagent. A transparent standard was prepared simultaneously, by cutting a clean portion of paper of the same area out out the chromatogram and treating with 5 ml of the eluting reagent. The test tubes were shaken for 1 h, 3-4 times; complete elution occurred during this time. Then the test tubes were centrifuged for 5 min and the optical density of the solutions measured on an SF-4A spectrophotometer in a quartz cuvette with l=1 cm at the wavelength 355 nm.

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