sn-2 position, which corresponds to the known situation concerning the distribution of acyl radicals in PLs. The qualitative composition of the fatty acids of the minor PLs was practically the same.

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POLAROGRAPHIC DETERMINATION OF COUMARIN AND CINNAMIC ACID IN THE PREPARATION FIBS

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Continuing investigations of the chemical compositions of drugs containing coumarins and their derivatives [1], we have developed procedures for determining coumarin and cinnamic acid, which are used as stabilizers in an injection solution of FIBS [2].

In an investigation of the electrochemical reduction of coumarins and cinnamic acids at a dropping mercury electrode [3-7], changes in the nature of the currents and the kinetics of reduction as functions of the compositions of the solvent and of the electrolyte and of the pH of the medium were found. The kinetic current of coumarin and cinnamic acid (pH 4-7) passes into a diffusion current at pH 7.4 (Britton–Robinson buffer) with $E_{1/2}$ = 1.67 V. Under these conditions, cinnamic acid does not give a wave. On a LiCl background in aqueous media, the first wave for cinnamic acid is observed at $E_{1/2}$ = −1.45 V. We have used these properties for the determination of coumarin and cinnamic acid in the preparation FIBS. The quantitative determination was made by the method of additives [7].

Determination of Coumarin. To 5 ml of the preparation was added 5 ml of buffer solution with pH 8-9, and the mixture was carefully stirred and was placed in the cell. Hydrogen

TABLE 1

Number	Series	Taken, g/ml		Determined, g/ml		Metrological evaluation
		coumarin	cinnamic acid	coumarin	cinnamic acid	
1	1070571			0,000100	0,000290	$\overline{X}=1,0\cdot10^{-4}$
2	1070572			0,000110	0,000292	$S=5,59\cdot10^{-6}$
3	2071071			0,000100	0,000228	$S_{\overline{X}}=1,97\cdot10^{-6}$
4	2101071			0,000 90	0,000276	$\pm E_{rel}=5,59\%$
5	1	0,000100	0,000300	0,000100	0,000290	$\Pi\overline{X}=2,83\cdot10^{-4}$
6				0,000098S	0,000300	$S=2,40\cdot10^{-5}$
7				0,000104	0,000305	$S_{\overline{X}}=8,49\cdot10^{-6}$
8				0,000099	0,000280	$\pm E_{rel}=8,48\%$

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or nitrogen was passed for 5-10 min, and the solution was polarographed with cathodic polarization in the interval of 1.20-2.00 V. Then 0.5 ml of a standard solution (0.1 g of coumarin and 0.3 g of cinnamic acid) was added to this solution.

Determination of Cinnamic Acid. To 5 ml of the preparation was added 5 ml of 5% LiCl solution, and the mixture was carefully stirred and placed in the cell. The subsequent procedure was the same as for coumarin. The results of the analysis of the preparation FIBS are given in Table 1.

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COUMARINS FROM THE ROOTS OF Ferula badrakema

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Some time ago [1], N. P. Kir'yalov isolated in large amount (2-3% of the weight of the dry roots) from the neutral fraction of the resin of the roots of Ferula badrakema K.-Pol. gathered in the region of Kyzyl Dzhar (Turkmenia) a coumarin compound which he called badrakemin [1].

We have studied the coumarin composition of the resin of the roots of this plant that had not been subjected to treatment with alkali. The plant material for the investigation was gathered in the environs of Kushka (Badkhiz, Turkmenia).

An alcoholic extract of the roots was chromatographed on a column of alumina (activity grade II) using benzene, benzene–chloroform, chloroform, and chloroform–ethanol. Individual fractions were additionally chromatographed on columns of silica gel with elution by chloroform.

As a result, we isolated: badrakemin acetate, in an amount of 2-3% of the weight of the dry roots; badrakemin itself and also isosamarcandin and umbelliferone, in considerably smaller amount; and conferol acetate in very small amount. The compounds were identified from their melting points and the identity of their IR spectra with those of known compounds.

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