REACTION OF DIBEPIN WITH AMINO ACIDS ON CHROMATOGRAPHIC PAPER

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UDC 543.544.42:547.466

A method was developed for the development of amino acids and some of their derivatives on chromatographic paper by means of dibepin – 8-[2',3'(CO),6',5'(CO)-dibenzoylene-4'-pyridyl]-1-naphthoyl chloride. The sensitivity was 2 μg in the case of glycine ethyl ester hydrochloride.

Dibepin – 8-[2',3'(CO),6',5'(CO)-dibenzoylene-4'-pyridyl]-1-naphthoyl chloride – is a reagent for the primary amino group [1, 2], and the reaction proceeds especially well with aliphatic primary amines. In the present paper, we have studied the color-drop reactions of dibepin with α-amino acids and esters of several amino acids on chromatographic paper (see Table 1).

In comparing the data in Table 1 with the sensitivity of the reaction of ninhydrin with these amino acids in the free form [3], it must be noted that the reaction of dibepin is less sensitive. As expected, the introduction of an ester grouping into the amino acid molecule does not interfere with the color reaction with dibepin but, on the contrary, generally improves the sensitivity (compounds Nos. 1 and 6). In addition the sensitivity is improved by a factor of almost two (compound No. 6) when the results are scaled on the basis of free glycine.

Judging from the results obtained, dibepin can be used as a qualitative color reagent for the development of several amino acids and their esters.

EXPERIMENTAL

A 0.02-ml sample of 1, 0.1, 0.01, or 0.005% solutions of the compounds indicated in Table 1 was applied to LS chromatographic paper by means of a micropipette, and the amino acid spots were dried at 100°C for 30 sec. A saturated solution of potassium carbonate in methanol and a 1% solution of dibepin in dioxane were then applied to the paper, and it was again dried at 100° for 30 sec. A 10% solution of sodium hydroxide in ethanol–water was then applied to the paper, and the appearance of a colored spot was noted.

TABLE 1. Color Reactions of Amino Acids and Their Derivatives with Dibepin on Chromatographic Paper

No.	Compound	Spot color	Sensitivity, μg
1	Glycine	Violet	20
2	α-Alanine	Blue	20
3	S-Benzylcysteine methyl ester hydrochloride	Blue	20
4	Lysine	Blue	20
5	Phenylalanine methyl ester hydrochloride	Blue	20
6	Glycine ethyl ester hydrochloride	Violet	2

Institute of Organic Synthesis, Academy of Sciences of the Latvian SSR, Riga. Translated from Khimiya Geterotsiklicheskikh Soedinenii, No. 3, pp. 357-358, March, 1972. Original article submitted May 7, 1971.

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