

SHORT COMMUNICATIONS

A Synthetic Resin Catalyzing Racemization of Amino Acids. I

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(Received March 19, 1962)

It has been demonstrated that salicylaldehyde, a benzene analogue of pyridoxal, catalyzes the racemization of amino acids in the presence of metal ion¹⁾. In the present work a resin which contains the salicylaldehyde group was prepared from *o*-cresol-formaldehyde resin by converting the methyl substituent of *o*-cresol to aldehyde. Crushed resin was oxidized with chromium trioxide in a mixture of acetic acid and acetic anhydride, and the acetal produced was hydrolyzed with 4*N* hydrochloric acid. The formyl content of the resin was found to be 0.16 mmol./g. of dry resin. This synthetic resin was used as a catalyst for the racemization of amino acids in the presence of cupric ion.

The racemization experiment was conducted with L-alanine, L-glutamic acid, and L-aspartic acid. An aqueous solution of each amino

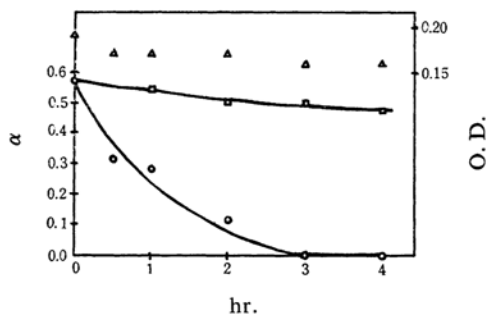


Fig. 1. Racemization of L-alanine.

- Optical rotation shown in the reaction catalyzed by resin
- Optical rotation shown in the reaction without resin
- △ Optical density by ninhydrin method

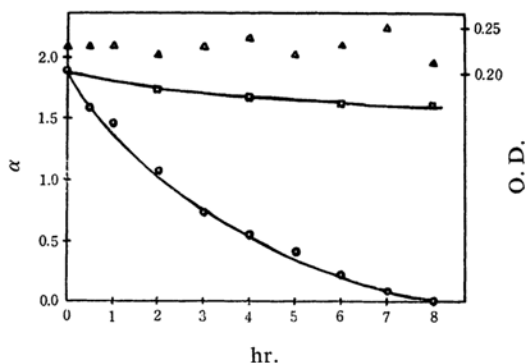


Fig. 2. Racemization of L-aspartic acid.

- Optical rotation shown in the reaction catalyzed by resin
- Optical rotation shown in the reaction without resin
- △ Optical density by ninhydrin method

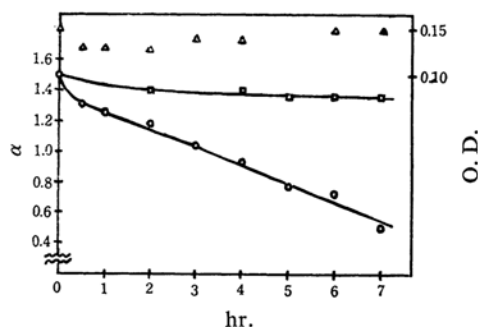


Fig. 3. Racemization of L-glutamic acid.

- Optical rotation shown in the reaction catalyzed by resin
- Optical rotation shown in the reaction without resin
- △ Optical density by ninhydrin method

acid, which was adjusted to pH 10 with sodium hydroxide and which contained 0.2 mol. of amino acid and 0.9 g. of cupric chloride in a total volume of 100 ml., was prepared. Fifteen milliliters of the above solution, 15 ml. of 0.2 *M* borate buffer of pH 10, and 5 g. of the resin were stirred at 100°C. The reaction mixture was removed at varying intervals of time and diluted with 12*N* hydrochloric acid, and its optical rotation was measured. The amino acid content of the reaction mixture was checked by the ninhydrin colorimetric method during

1) K. Ohno, I. Sasaji and M. Hara, Abstract of the 12th Annual Meeting of the Chemical Society of Japan (Apr., 1959), p. 27.

the course of the racemization. The results are shown in Figs. 1—3.

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